The Production, Distribution and Marketing of Fruit and Vegetables for the Urban Market of Dar es Salaam

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Abstract

This study reviews four main approaches to the study of food supply for the urban areas of the developing world and finds them to be narrow in their foci and limited by the demands of the disciplines in which they have been developed. In order to overcome these difficulties, this study proposes a synthesis of the approaches for the study of the supply of fruit and vegetables to Dar es Salaam. This approach examines the problem of food supply through the evidence of price and volume data, of interviews and interview surveys, of observations of the marketing process and it integrates interpretation of literature and the evidence of observers in the field. The only state control exerted on the marketing of fruit and vegetables in Dar es Salaam, has been that it must be sold through the Kariakoo Wholesale Market. This market's role in wholesale trading has declined in favour of the emerging informal sector, during a period of more general economic liberalisation, which took place in Tanzania outwith state control during the 1980s. However, Kariakoo maintains a central role, handling approximately half of the city's fruit and vegetables. The informal sector for wholesale trading of fruit and vegetables has moved to more peripheral markets, where it is possible to distribute the produce more rapidly and at less cost. At each stage in the marketing system the participants have a range of options open to them. The choice of channel into which they sell their produce, depends on a trade-off between costs and price, which varies according to the commodity to be sold. The result is that vegetables tend to favour Kariakoo Wholesale Market and the city council maintained retail markets, while fruit tend to be traded at the informal wholesale markets and may be sold retail either in a retail market or at a street stall. There is an increasing trend for produce to be sold to informal wholesale traders at the nearest market on entering the city. This is particularly the case for fruit. Some markets are beginning to specialise in the informal wholesaling of the produce from the regions connected to the city by the nearest main road. To the extent that the producing regions tend to specialise in the production of certain commodities, a commodity specialisation among these markets is beginning to emerge. This study also presents a method of modelling the information in order to assess the potential each supply area has for supplying the city with produce on the open market. Finally a number of policy considerations are discussed in the light of the results of this analysis.

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List of Contents

List of Figures

List of Tables

List of Photographs

Chapter One

Introduction

1.1 The Context of the Study

Three main schools of thought exist in the study of urban food supply in Africa. In addition, Guyer's (1987) suggested a fourth, consolidating each of the three into an historical approach to urban food marketing. This thesis proposes that each has merit, although each is limited in its explanatory power by its particular approach and ideological basis. The approach adopted in this study, therefore, attempts to avoid these limitations by approaching the supply of food as a system. It therefore examines all aspects of the supply chain of fruit and vegetables for the urban market, drawing on the useful and relevant aspects of the three main approaches already established in the literature.

Third world urban areas are expanding, both physically and in terms of population, at a very rapid rate. Cities, such as Lagos, Kinshasa and Dar es Salaam, have been growing at about 10 per cent annually over the last 20 years - the major component of this being massive rural-urban migration. Coupled to this is the situation in many countries where one, or perhaps two, cities have grown to dominate a particular country's political, economic, social and cultural life. This phenomenon of urban primacy shows no sign of decline in much of Africa. The heavy concentration and focus of rural-urban migration, transport networks, and distribution systems can cause immense strain on the economy and infrastructure of the city, as well as that of the surrounding region. The results of this are urban unemployment, housing shortages, inadequate infrastructure and lack of general social welfare. The urban areas of most developing countries have experienced very rapid and concentrated urban, political and economic development, creating an ever swelling demand for food. The food supply systems become increasingly complex as the demand and the area required to supply this demand expands, such that it could be argued that an adequate and reliable food supply for the growing cities of Africa is the key urban problem today for that continent (Drakakis-Smith, 1991). As Sporrek (1985, p.12) puts it: "Few conditions can so easily deteriorate into a situation of social unrest as a malfunctioning urban food system." Urban food supplies have crucial political implications, as in, for example, Sudan, Tunisia, Zambia and Egypt, where recent food riots have taken place. In the case of both Tunisia and Zambia the food riots have been linked to the raising of staple food prices in agreement with IMF recommendations (Bryceson, 1985; The Sunday Observer December, 1986). In each of these four examples, the urban unrest has placed enormous political pressure on the respective governments. The importance of this is explained well by Pletcher (1982) in his examination of Zambian agricultural policy.

> "Social power for the state lies with those who can topple it. In the short term farmers offer little of the immediate threat which strikers or angry crowds present. Therefore, when tight times come, it is easier politically to squeeze the farmer a little harder than the rest. The long run effect is to make farming so unattractive it deteriorates."
>
> Pletcher (1982, p.220)

This is equally likely to be the case in Tanzania as it is in Zambia. Indeed, Bryceson (1985, p.503) explains that "Dar es Salaam accounts for roughly 50 per cent of the national consumer purchases of (officially marketed) maize meal, rice and wheat flour." This figure can be revised upwards for the maize meal staple *sembe*, when Bryceson later reports that "By 1984/85, 70 per cent of National Milling Corporation (NMC) sales took place in Dar es Salaam and 30 per cent in the regions, whereas in 1974/75 these figures were reversed." (Bryceson, 1990, p.6) She goes on, "This may be explained by the fact that the city has the highest concentration of government officials, expatriates and diplomats and has the highest wage labour force. These three groups exert considerable pressure on the state to ensure the city's food supply" (Bryceson, 1985, p.504). Paddison *et al* (1990) suggest that the development and viability of cities in developing countries depends on the availability of sufficient food supplies for their population. The scarcity of the literature in geography on food supply is highlighted by Drakakis-Smith (1991, p.51) "The sparse nature of research of this topic stands in marked contrast to the literature on housing which is more voluminous, and yet urban social protest is far more likely to be initiated by food shortages or price rises than by housing problems."

There is evidence in Tanzania that the decline in agricultural productivity, which took place during the period from the mid 1970s to the mid 1980s, is characterised by the withdrawal of peasant producers from the cash economy and their reversion to subsistence agriculture to ensure household reproduction (Hyden, 1980; Griffiths, 1980; Raikes, 1986), or to producing for sale on an informal market or only within the local market (Bryceson, 1990). The benefit to the nation of this is that it ensures that the rural areas and nearby towns always have sufficient food supply, whatever happens in the urban formal markets. The disbenefit is that the agricultural potential of the country is not fully realised. This theme will be discussed later in Chapter Two, with reference to the broader impact on the nation. However, it is clear that politicians, planners, local authorities and participant groups must have a comprehensive understanding of the urban food supply system, including rural production, if they are to have any positive influence on it.

"The most important class conflict in the poor countries of the world today is not between labour and capital. Nor is it between foreign and national interests. It is between the rural classes and the urban classes." So begins Lipton's (1977, p.13) critique of rural-urban relations. Guyer (1987, p.5-6) argues that the city and its hinterland as a case study provides a "consistently isolable unit of analysis, carved out by their own administrative history from larger national structures." The study of the rural supply of food to the city involves broader social and economic as well as geographical processes at work in rural-urban interactions. The city, as an

area of considerable food deficit, serves to focus the trade of food within the country. In this way the city serves as a focus for food distribution in the same way as it does for the political and economic life of the country. Thus a study of urban food supply may provide more general insights into the nation's food production and distribution system. As has been discussed earlier, the study of urban food supply in Less Developed Countries (LDCs) countries is of crucial political and economic significance. It will also be of great benefit in reaching a more general understanding of food distribution and marketing by providing detailed knowledge of the case study of a contained example of a system supplying food to an area of food deficit.

In his contribution to Bohannan and Dalton's (1962) major reference on marketing in Africa, McCall (1962) distinguishes two types of 'market'. Firstly, he refers to "the production and distribution of goods (predominantly, but not solely foodstuffs) for local consumption and (secondly) the export of commodities which form part of the network of world trade." (McCall, 1962, p.667) In addition to these definitions, the word 'market' may also refer to the place where marketing, as defined above, takes place. (Epstein, 1982) The word 'marketing' has also been adopted more recently for the much more sophisticated activities which take place in advanced economies, which includes planning and executing the product conception, pricing, promotion and the distribution of ideas, goods and services "to create exchanges that satisfy individual and organisational objectives" (Kaynak, 1986, p.12). These latter two definitions will not apply in this discussion, although Kaynak's concept of marketing as an important catalyst of economic development in Less Developed Countries is worth brief consideration. He argues that in the past the trading functions (in this case he is referring to the general meaning of buying and selling) in Less Developed Countries have been ignored in favour of extractive or manufacturing activities and attempts at capital formation. Paddison *et al* (1990) suggest that this is due to the assumption among economists that investment in the productive sectors of the economy would encourage the development of consumption. Kaynak argues that this has resulted in neglect of marketing activities for three main reasons. Firstly, he argues that "traders are widely regarded as 'parasites' and as such, trade has a low esteem as a profession". Secondly, in many developing countries, trade, and especially wholesale trade, is dominated by ethnic minorities. Finally, because of these negative attitudes towards trade "government policy makers tend to underestimate its contribution to the national economy. In most cases trade accounts for some 20 per cent of the GNP of these countries" (Kaynak, 1986, p.17). These three arguments may be contested, but what is clear is that trading in many developing countries is a highly adapted, dynamic sector of the economy, and that its contribution is often underestimated or taken for granted by policy makers and governments. By describing trading in developing countries as the economic bridge between production and consumption, Kaynak goes on to argue that marketing stimulates development rather than is dependent on it, and improvements in marketing "in any economic system can aid in economic development by leading to a more efficient use of existing productive resources" (Kaynak, 1986, p.17).

Bohannan and Dalton (1962), in their introduction, distinguish further between marketing and trading. The word 'trade' has a variety of uses: "(1) any commercial transaction regardless of its site, the kinds of goods transacted, their destination or their personnel. (2) Those activities done only by professional specialists which provide them with their livelihood. (3) Any external transaction (foreign trade)" (Bohannan and Dalton, 1962, p.12-13). With these distinctions in mind, the following discussion will use the words "market place" to refer to the location of trading and marketing activities in the rural and urban areas studied. 'Marketing' will refer to the selling of produce as part of the economic activities of a household, in other words the selling of surplus foodstuffs for cash (as in McCall's first definition). 'Trade' will refer to the buying of produce with the intention of reselling as a method of earning income, as in the case of professional traders (in Bohannan and Dalton's second definition). Other definitions of these latter two words, which refer to foreign trading or exporting and the more vague activities of buying and selling, will be avoided.

In their very thorough examination of Tanzania's "second economy", Maliyamkono and Bagachwa (1990) find that there is a very broad range of definitions and overlapping terms applied in the literature to this phenomenon. These include criteria relating to the legality of the activities, whether they operate inside or outside of the state benefit and regulation system, whether they escape taxation, whether they are included in gross national product calculations, or whether they are monitored by official statistics or by those activities which lack formal transactions (Maliyamkono and Bagachwa, 1990). They go on to distinguish five food marketing channels outside the official market channel. Firstly, the 'traditional' channel, involving direct sales between peasants, which may be regarded as part of subsistence consumption, although traders purchasing from rural markets, where this form of trading predominates, are well concealed from official detection. Secondly, there is what Maliyamkono and Bagachwa describe as 'shuttle' marketing, where small quantities of food, perhaps one to three sacks, are carried by bus or lorry to a nearby town where a better price may be expected, and where consumer goods may be more cheaply purchased. One could include in this, peasants visiting urban relatives and carrying with them foods and returning with consumer goods, or the other way around. Thirdly there is the 'inter-regional' trade involving large quantities of foods carried by lorry from surplus regions for sale in areas of high demand. This channel usually involves trading specialists, in other words, people whose sole or main occupation is inter-regional trading. However, some are occasional traders, who may own or drive lorries transporting other goods, and which only occasionally have space which can be used to transport some food. Fourthly, there is the urban open market, which has been in existence for some time. This is often fed by the 'inter-regional trade channel, but may also be fed by informal urban and peri-urban production of foods. Foods are sold in both processed and unprocessed forms. Finally, there is the 'export' market where goods are smuggled out of the country. This, according to Maliyamkono and Bagachwa has arisen out of adverse producer prices and poor management

of the export crop marketing boards, making smuggling a more lucrative way of disposing of produce. This study will be concentrating on the third and the fourth channels as these appear to account for a large proportion of unofficial supply of foods to the urban markets. Mention will be made to other channels where relevant, particularly the first and second.

This chapter will go on to review approaches to the study of urban food supply in Less Developed Countries. It will begin by identifying four distinct approaches to the subject. It will move on to analyse three urban food market case studies: the city of Mysore, India; the city of Kampala, capital of Uganda; and the city of Dar es Salaam, primate city and former official of Tanzania. Finally, conclusions will be drawn in the light of these approaches to the study of urban food supply, as well as areas of focus for the present study.

1.2 Approaches to Urban Food Supply Studies

What becomes clear from an initial review of the literature is the recent tendency to attempt to fuse perspectives of the various disciplinary approaches to food marketing, or food policy (Hansen and McMillan, 1986; Gittinger *et al*, 1987; Guyer, 1987). This seems to be as a result of two factors. Firstly, previous strictly disciplinary research has arrived at erroneous, or simplistic conclusions because of an incomplete analysis of the food systems under consideration. For example, an economic approach to rural markets may demonstrate that it is not profitable for many of the sellers to attend them. This conclusion does not take into account the immense social and cultural importance of such a market, which can make a purely economic gain at the market less than relevant to the participants. This is what Jones (1972) describes as one of African markets' malfunctions. He describes this phenomenon as groups of "participants in the market (who) are unproductively employed or are not seeking economic gain. Many social, political and administrative activities, in addition to the purely economical ones of buying and selling, typically characterise each marketing meeting" (Jones, 1972, p.10). Indeed, one of the interviewees in the current study described how women in Lushoto District in Tanzania may purchase produce from a neighbouring producer, if they themselves had run out of produce for selling at the periodic market, even if this meant they would be out of pocket at the end of the day. The reason was that immense social and cultural importance was placed on attending the markets.

It may also be argued that it is extremely difficult to monitor accurately the volumes, prices and transactions prevalent in such rural periodic markets. The units of measurement are not uniform, with sellers frequently selling produce in arbitrary piles, but also in containers which vary in size depending on the commodity. In the protracted discussions over the price which can often take place, both parties may suggest various rates of exchange, varying both the price and the volume. In addition, preferential rates may be offered to, or obtained by, customers known to

the seller or those purchasing larger quantities, and increased rates to those who appear able to afford a higher price. Additional variations in price may be obtained by either the seller or the buyer according to the variety, origin or quality of the produce. Finally, with reference to the production of food crops in Africa, many are produced on mixed-crop plots, where trees may be mixed with one or two other crops. This provides a variety of vegetative input to the soils, while extracting different nutrients and the trees provide shelter for the lower crops from both direct sun and tropical rain storms. This makes the estimation of crop yields per unit of land extremely problematic.

Secondly, food systems themselves - due to the importance of food to survival - are the subject of study in such diverse disciplines as agriculture, anthropology, economics, geography, government policy, marketing, medicine, sociology and, doubtless, more besides. The result is an approach to food supply systems which highlights the aspects of particular interest, or which is easier for the disciplines to study, given the different acceptable research methods available to them. "In studying market place trade as an aspect of economic development different social science disciplines have focused on different aspects of the problem." (Epstein, 1982, p.209) For example, anthropology approaches its subject from the perspective of the groups of people involved in the system, requiring the researcher to visit and live in the rural producing area making observations and interviewing the participants. Economics, on the other hand is interested in the variations in price and supply and role of capital in the system and will collect data measuring these factors, or at the very least approach the subject from this point of view. Legitimate though these approaches are within their discipline, they do not provide an overall view of the food supply system. Guyer (1987, p.6) argues that although this diversity has provided researchers with varied insights into food supply, a juncture has been reached in its study where "..particular dynamics cannot be studied without a recomposition of the field." Drakakis-Smith (1991, p.51) comments that research on food supply in "...geography, but also in related social sciences, has been patchy so that although some elements, such as the nutritional problems resultant from inadequate diets or the operation of markets, are reasonably well covered, it is difficult to formulate a comprehensive framework."

Because of its highly complex inclusion in human life, "a broadly based integrated policy approach to supply, distribution and consumption is essential if everyone is to be assured access to food." (Gittinger *et al*, 1987, p.ix) Previous attempts have been limited by their more narrow approach. In his book Marketing Staple Food Crops in Tropical Africa, Jones (1972) took up the subject from an economic perspective, concentrating on an analysis of four African marketing systems. He compares each of these systems, measuring their performance using variables of price and volume, against his idea of a free market, focusing on what he calls 'imperfections' in the African market systems. As a result, the conclusions Jones reaches are preoccupied with this way of examining food marketing systems. This may result in problematic

conclusions unless backed up with additional data. Price data alone are open to interpretation, as discussed above, and are, therefore, insufficient for the purposes of policy analysis without additional evidence. For example, the result of an analysis may show price stability of a commodity. However, without additional evidence this may equally be the result of monopolistic control or competitive conditions. There is no way of deducing a conclusion in the event of equifinality such as this, without corroboration from sociological or political data. In addition, there can be serious questions regarding such secondary data as are available for wholesale and retail activities. Frequently they concentrate on the formal structured market and ignore the unstructure informal market. Samiee (1990, p.36) reports that, according to 1980 UN data, Egypt, with a population of over 41 million, has only 1,018 retail establishments.

Jones (1972) examines the workings of the market and the ways in which government can intervene to improve its efficiency, such as disseminating price information, forming commodity exchanges (he quotes the success of such exchanges in the United States of America) and geographical production specialisation. Guyer (1987) reviews a series of works associated with Jones and the Stanford Food Research Institute, which put forward price analysis as a method of research, and which employs historical and sociological evidence *ad hoc* to strengthen price analysis interpretations. However, Guyer argues that the integration of historical and sociological study is indispensable to a comprehensive food market analysis, and that rather than being peripheral, this evidence should be examined in conjunction with quantitative price data. There are two reasons for elevating qualitative data to a status similar to that of economic data. Firstly, although qualitative data may be considered to be less objective, questions may also be easily raised regarding the accuracy and representativeness of the price data. Indeed, the immense difficulties of collecting such data in developing countries increase the necessity of handling them with extreme caution. Secondly, Sen (1982, p.159) argued that there is a "need to view the food problem as a relation between people and food in terms of a network of entitlemet relations." In other words, the political dimension to food supply is fundamental to an understanding of food supply problems and food security. Such factors are not readily quantifiable, particularly in the context of a developing country.

Polly Hill (1963) demonstrates the difficulties of approaching the subject of markets in Africa from such a quantitative point of view:

> "It is not so much the heat, the glare, the bustle, the over-crowding, the noise, the shouting, (and consequent hoarseness), or even the sneezing caused by open bags of pepper and maize (for all this is compensated by the very courteous behaviour of Africans in markets) -- the difficulties are rather the extreme fluidity and complexity of the undocumented situation and the need to trouble informants at their moment of maximum anxiety, when they are concluding transactions. Perhaps one day economists will devise new techniques, presumably involving

> teamwork, for tracking and identifying the variables in these anti-laboratory conditions. Meanwhile it is to be hoped that the hardships endured in market places by individual anthropologists will not have been in vain."

(Hill, 1963, p.445)

Guyer (1987) describes the social anthropological approach to marketing as 'Francophone themes' and goes on to distinguish a further approach to the study of food supply systems, which she describes the 'British themes', although their proponents are by no means confined to these nationalities. These approaches seem to have arisen out of the different perspectives of the researchers and the different colonial government priorities, both partly as a result of the distinct historical experiences of Britain and France. For example, the French colonised large expanses of sparsely populated countries in the Sahel and central Africa, whereas the British governed the densely populated areas such as the Gold Coast and Nigeria. In addition, the distinction in these approaches may have come out of the different national histories of the colonial powers themselves. There is a long history in France of criticising the government use of control of staple food supply to Paris, creating tensions between the state, the consumer, producer and the intermediaries. In Britain, on the other hand, there was wage unrest after World War II resulting in the construction by government of wage subsidies. Furthermore, French scholars have tended to approach the question of food supply as a highly colourful anthropological phenomenon, describing *how* food is traded, whilst British scholars have tended to approach the question from the point of view of *who* food is supplied to, as exemplified by Sen (1982) in his book Poverty and Famines,

> "..., if we look at the food going to particular groups, then of course we can say a great deal about starvation. ...one is not far from just describing the starvation itself...clearly, they didn't have enough food, but the question is *why* didn't they have enough food? What allows one group rather than another to get hold of the food that is there? These questions lead to the entitlement approach..."

(Sen, 1982. p.154)

The French tradition, which approximates to a social anthropological approach, concentrates on the various forms of social organisation which deliver the goods. As such, this school focuses on certain issues, such as the sources of the food, the types of transport, the locations and number of the various transfers of the provisions. This approach also makes certain assumptions, such as "the institutions of distribution take precedence over market principles as the subject of research" (Guyer, 1987, p.15). The state, in this case, becomes not the initiator of beneficial policies for the workings of the market, but simply another social institution, which is potentially, and often actually, in conflict with indigenous organisations or groups of the population. However, there are problems with this approach. It is swamped with enormous and graphical descriptive detail, but lacks focus. This approach is exemplified in the workd of Piault (1971), Cohen (1971) and Amselle (1971) describing aspects of modern-day West African markets. There are questions left unanswered concerning the method of the definition of research priorities and the most important issues involved. The means by which the institutions,

involved in food supply, have influenced policy and prices is rarely covered. Finally, there appears to be no generalised framework and no strategy for further investigation.

The alternative approach, associated with British researcher perspectives, may be described as a consumer-oriented approach, focusing on urban real incomes and poverty in relation to food supply. It links prices and marketing institutions to real incomes and standards of living. It investigates the access of lower income households to food markets and the sources of their supply. It examines social class and local social structures and their impact on food distribution and consumption. Its focus is on social welfare, and although it may analyse production, distribution and consumption, it will always return to the income implications for the producer, the trader and the consumer. This is most clearly explained by Croll (1983, p.7) when she says it "examines both access to national and local food circuits and the demands that food policies make on the material and labour resources of the household so that it produces, purchases and processes sufficient food for its members' subsistence." This concentration on class (or occupation as an indication of class) allows questions of the class implications of the economic process to be addressed, and brings relative poverty into focus. There is a concern with the acceptability of income levels under certain political conditions, and the allocation of access to those food supplies which do exist. For example, it may view state intervention in terms of economic welfare, and therefore political stability, rather than market efficiency (Sen, 1982; Croll, 1983; Ellis, 1983). This approach appears to appease Guyer's (1987) demand for an historical dimension, by referring to post- Independence or immediate pre-Independence experience, although it tends to be limited in this by the short time-period over which such data have been collected. This approach neglects the question of rural-urban interaction or bias, because of its concentration on class. Its objectives are narrow, though generally explicit. "It is concerned with how acceptable, or at least livable, income levels have been established in different areas, under different conditions." (Guyer, 1987, p.18)

The fourth approach may be termed an historical approach. It attempts to incorporate some elements of the above three traditions into an historical approach to urban food supply analysis. It is characterised by Guyer, where she argues for the integration of "the three dimensions which have tended to be separated in Africanists' work: market prices, the social and political organisations of production and trade, and the class implications of incomes" (Guyer, 1987, p.19). She argues later that a focus on local areas, where all these dimensions meet, is one step towards building an understanding of the organisation of the society, by allowing them to be examined on a small scale. "Understanding the influence which former organisational rubrics and material conditions exert throughout a particular region's...(history)...is an agenda with which...case studies engage, but which is, ultimately, a far broader social scientific problem" (Guyer, 1987, p.47).

However, rather than answer questions, this approach raises them. An historical approach is an important method of contextualising the problem and raising the questions which require to be asked. Rather than introducing (or imposing) an agenda for research, one finds that questions are raised and directions for seeking answers suggested. For example, Bryceson (1985, 1987) describes the development of the food supply in Dar es Salaam through periods of crisis and balance. She concludes that it is simplistic to promote the balancing of Tanzania's external trade and finance and the lifting of government controls as solutions to Tanzania's food deficit problem. There are long-term goals which must be considered, not least of which are the socio-political impacts of such measures. Straightforward economic measures, she argues, are steeped in ideological debates concerning the role of the state in the economy, whilst attention should be paid to the impacts of such measures on the stability of the economy, and ultimately on the people. She suggests that a series of policies be implemented which are aimed at curbing rural-urban migration, at firing the initiative of the trader and producer, and at encouraging a sense of professionalism in the bureaucrat. However, what are these policies to be? How would they achieve their objectives? What parts do government, as well as the traders, producers and consumers play in them?

It would appear that each of the above traditions tend to concentrate on one or two areas of research at the expense of the rest. The first three approaches provide us with detailed analyses of different aspects of the food supply chain. An approach concentrating on quantitative economic data has inherent problems involved in the data collection and interpretation, as it tends to focus on prices, volumes and values of formal market transfers. An anthropological approach tends to focus on empiricist presentations of the markets and fairs where the food is bought and sold with an emphasis on the cultural importance of markets to a variety of interest groups and institutions in the societies. An approach concentrating on the impact of the food marketing system on the urban population's welfare can over-emphasise the role of the state at the expense of the already efficient marketing system. It can identify institutional defects in the allocation of accessibility to the supply of food for the urban poor. The historical approach provides a good starting point, contextualising the problem of food supply by setting in place the cultural and institutional legacy of the society. Each of these four approaches to the study of urban food supply, may reproduce a valuable view of an urban food supply system. However, any picture of urban food supply which is painted in only one of these dimensions will ultimately lack the overall depth which can be achieved using a far broader conceptual framework.

Meanwhile, a further approach can be distinguished which has had a more limited impact outside geography, but within the discipline is widely regarded as being of great influence in its time. These approaches are applied mainly to rural marketing systems, with some considerable interest in attempting to explain the phenomenon of periodic marketing. There is

a limited number of studies which examined the case of urban marketing, but these will be examined in more detail in the next section. Barrett (1986) distinguished two explanations of market development within a geographical approach to market systems in developing countries: central place theory and the diffusionist approach. The central place explanation is based on Skinner's(1964) study of trade and marketing structures in rural China. Skinner identified systems of market towns connected through flows of goods and services, and movements of traders and consumers. These spatial linkages resulted in hierarchical systems of markets with overlapping hexagonal hinterlands. The explanation of this hierarchical system is that trading takes place between small peasant centres and these evolve at varying rates depending on their relative locations in relation to their hinterland.

The diffusionist approach is based on the work of Hagerstrand (1952) on historical records of innovation diffusion in central Sweden. This follows a three stage process, where first multiple centres of adoption emerge; secondly, new centres grow up and compete with the initial adoption centres; and finally additional increments are not feasible as all centres have adopted the innovation and a stage of saturation is reached. The adoption of an innovation is more likely close to an early adoption centre and reduces with distance from it.

The first theory assumes the importance of the evolution from peasant-to-peasant trading to rural-to-urban trading. The second sees a process of 'top-down' penetration of the market system. Barrett suggests that each theory may have greater power of explanation depending on the local conditions. For example, she argues that studies where the diffusionist explanation has been successfully applied, the growth of the market system has taken place relatively recently, and has occurred in conjunction with many other changes such as improved socio-economic conditions and transport provision. In areas where central place theory has been successfully applied, markets are already in place, and the adoption of the market system moves outward from established centres, forming hierarchical relationships between centres of differing importance in the marketing system. This process tends to strengthen the position of the established markets and results in a hierarchical pattern of rural-to-urban trading. Further dimensions exist within most market systems, however, and these must be examined in order to explain, rather than describe the development of market systems.

Ideally, the study of an urban food supply system should address itself to issues of efficiency of supply to all sectors of the population. Put slightly differently, the ability of all sectors of the population to get access to food supply should be assessed and the real cost of that access investigated. The study which follows addresses itself to the role of the various actors and structures involved in the food supply chain, such as the government, city or state marketing authority, the national infrastructure, the immigrant traders, the producers, the consumers and

those involved in all stages of buying and selling in between. The relations between these institutions requires examination. An assessment is also required of the effect of the relative power or influence of these institutions in the system. Clearly this investigation must incorporate the formal and informal aspects of the food supply system, since the estimates of the informal sector's role in food supply, even in countries with heavily managed food markets, are relatively significant. Sporrek (1985) estimates that the informal sector accounts for 50 per cent of food marketing in Dar es Salaam. This requires an economic analysis of the price and volume data held by formal marketing agencies as well as attempts at data capture within the, at times, elusive informal sector. In calling for an overall framework for the study of urban food distribution systems in Africa and Asia, Drakakis-Smith suggests that geographers are well placed to investigate the broad issues involved, since they "must focus not just on the commodity itself but also on the economic, social, cultural and political factors which affect the system" (1991, p.51).

1.3 Case Studies of Urban Food Supply

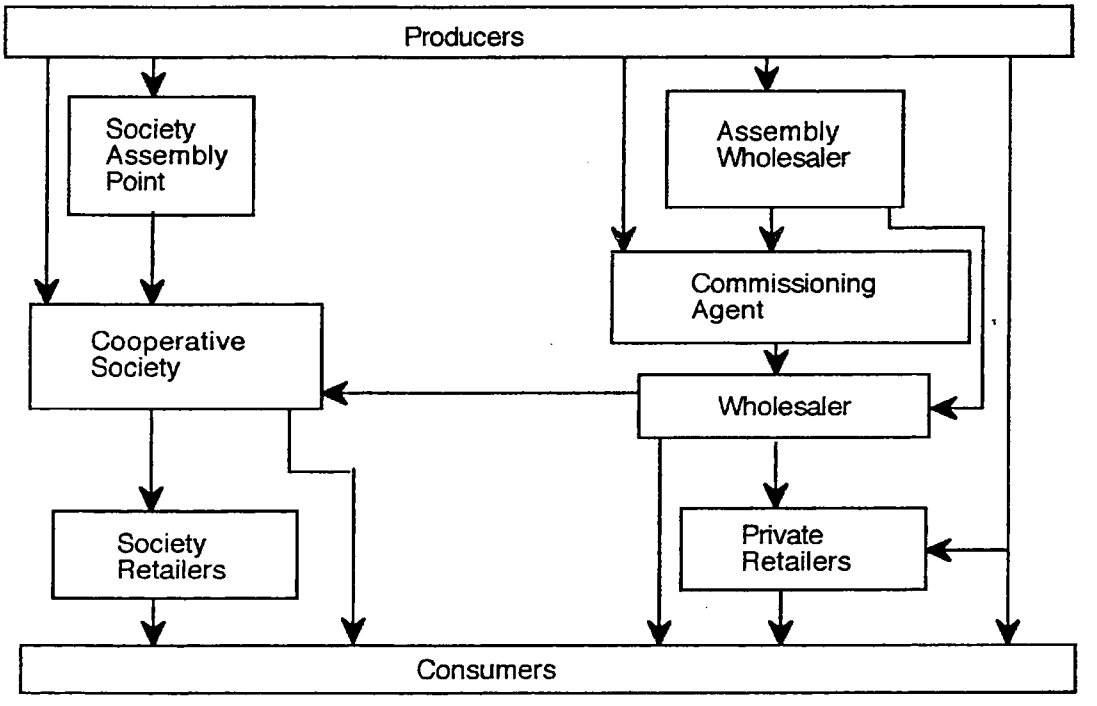
The section above discussed the main approaches to food marketing in general. Guyer (1987) suggested using the city and its hinterland as a case study which is relatively self-contained. This section will examine three examples of such an approach, although in each case they have concentrated on the contemporary situation of the marketing system, particularly concerned with the locational aspects of the marketing outlets. In this sense this offers a fifth, geographical, approach to food supply in Third World cities. Although these approaches do not attempt to reproduce an urban version of the Skinner-Christaller approach to market location, much of the underlying preoccupations of explanation in terms of spatial location, are still present, as attempted by Skinner in Nigeria (1962) and then in China (1964) and Christaller (1966) in southern Germany. The more recent studies adopting this approach have moved on to attempt to incorporate interpretations of the marketing process into the analysis of the supply and distribution patterns in terms of the supply chains, the relative roles of the wholesale and retail elements, or formal and informal sector, the importance of the different groups of supply chain participants, from producers to consumers (Lavrijsen and Sterkenburg, 1976; Tarimo, 1977; Epstein, 1982; Boekholt and van der Veen, 1986). The value of these case studies will be discussed later.

Mysore, India

Boekholt and van der Veen (1986) present results of field research carried out in 1980 and 1981 into vegetable and milk marketing in the city of Mysore Karnataka in south-west India, although this paper only deals with vegetables marketing. The city had a population of 500,000 in 1981. It has mainly developed through tertiary activities, such as tourism, education and research. The

majority of its inhabitants live in the central neighbourhoods, where population densities are high. The lower socio-economic groups have tended to live in the higher density residential neighbourhoods, while the higher status groups tend to live in the more spacious, recently built neighbourhoods in the city's outskirts. Within the city, vegetable production is limited. The most perishable leafy vegetables, such as curry, radish, and coriander leaf, which have a low value to volume ratio, and are most profitably grown on a small scale in a private garden or on horticultural land at a short distance from the consumer. The bulk of vegetables are supplied from outside the city. Farmers growing in a zone with a 25 to 35 kilometres radius, bring their produce in to the city and sell either direct to the consumer, or, more frequently, to marketing agencies. Alternatively vegetables may be supplied from a considerable distance such as 160 kilometres south (Nilgiri Hills) or 120 kilometres north-east (Bangalore, state capital and a major vegetable collecting and redistributing centre in South India).

Figure 1.1 Model of Food Marketing Channels in Mysore, India .



Source: Boekholt and van der Veen (1986, p.118)

The main flow of vegetables is distributed through the open market and the dominant form of marketing is via commissioning agents. These generally act as intermediaries between sellers (farmers) and buyers (wholesalers or sometimes retailers). The majority of farmers find this less time-consuming than the alternative of retailing the vegetables themselves. The commissioning agent, although charging a commission, generally accepts any amount, kind or quality of vegetables. Figure 1.1 describes the main institutions involved in the fresh food trade, delivering to the Mysore market. However, it does not give any indication of the varying levels of importance each institution plays in the overall supply. For example, in their paper,

Boeckholt and van der Veen (1986) indicate that the most important group for supplying the city are the private traders, although no data are presented to explain this statement. It appears to rest solely on the argument that by selling to commissioning agents farmers are saving time and they are assured of a sale if they approach a commissioning agent because "he generally accepts any amount, kind or quality of vegetables" (Boeckholt and van der Veen 1986, p.117). The Cooperative does not have as important a role to play in terms of volume of supply, but again no data are offered to give an indication of the Cooperative's relative role in the food distribution system. We can only assume from the facts that the Cooperative has "some" regional centres where it assembles rural produce and it has one central godown from where it supplies its own shops with two mobile vans, and that it operates on a modest scale in comparison with the open market.

The retailers can be divided into three broad categories: street sellers, market place retailers and specialised shops, the last being of relatively low importance. The first two generally buy relatively small amounts from wholesalers, or, in some cases, they may approach farmers at the assembly point. The cooperative chain is relatively small-scale. The cooperative society was begun in 1968 and it collects its vegetables at its own assembly point and transports it to its own shops. It makes up on short supply by buying from the private market.

With regard to vegetable shopping, there are differences in the demand patterns of the inhabitants in different areas of the town. Mysore can be split into three neighbourhood types according to population density. Each has a different pattern of shopping behaviour.

(i) The older, centrally located and densely populated neighbourhoods have a fully developed retail structure with markets, generally very proximate, as the predominant outlet. Consumers tend to buy on a daily basis.

(ii) The less densely populated areas have a less developed retail structure. A local market is of importance for daily purchases, but a large market is generally visited less frequently, for example weekly, for larger quantities. The importance of door-to-door vendors depends on status. Lower and middle class are likely to find them more important than the higher class, where transport costs are less restraining.

(iii) The fringe neighbourhoods have the least developed retail structure. With an absence of local markets, centrally located markets and door-to-door vendors, hawkers and shops complement each other. The central markets will be visited on a less than daily frequency, while local retailers meet daily needs.

The authors come to the conclusion that the 'informal sector' plays a dominant role in vegetable retailing. 'Informal' is not explicitly defined, although it is implied to be retailers who do not sell from fixed retail outlets. The 'informal' sector under this definition has demonstrated an ability to react in a flexible and adequate way to changing circumstances. This the authors put down to 'satisficer' behaviour rather than profit maximisation. This sector is particularly important, where it has adopted to supply the urban poor who are not resident near a retail outlet or who cannot afford to travel to one on a regular enough basis.

Kampala, Uganda

Temple (1969) in an attempt to fill the dearth of information on urban markets in Africa wrote of Kampala, capital of Uganda. This study focused on the retail markets themselves, attempting to assess their nature, size, structure, relationships with one another, as well as consumer habits and the supply side. The fieldwork was carried out in 1964. The spatial distribution of the market places was found to be closely adjusted to the distribution of consumers. Urban expansion led to increasing spread of market places, while increased population led to growth in the size and number of markets. Within the city of Kampala, the development of market places was carefully supervised and regulated. However, outside the city, in related urban areas, market development was allowed to carry on unchecked. Despite planning controls inside Kampala city, the advantages of proximity to the urban core, of wholesale functions, of greater effective demand and of a better developed transport network have combined to make these markets larger and place them at the top of the market hierarchy for the whole urban area.

Outside the Kampala city boundary, but still within the urban area, markets tend to locate according to two factors. First, the attraction of main road intersections has served to attract suppliers and consumers on their way home from work. Second, the markets have tended to gravitate towards the Kampala city boundary. This location takes advantage of the more lax planning and sanitary supervision, lower dues and more flexible marketing arrangements, while still able to serve city centre residents as well as commuters and residents outside the city boundaries. Bye-laws restricting the selling of certain goods within a mile of the market boundary has further affected the spread of markets outside the city boundary. Within Kampala the markets were arranged according to an orderly plan, constructed of permanent materials, furnished with concrete benches and stalls, with roofs and with car parks alongside.

Temple attempted to rank the markets according to size using three different variables, although he readily accepted that each had their drawbacks. First, market revenue was used, showing Nakasero (the oldest market) as the dominant market place. However, Temple pointed out that there were different procedures for collecting market revenue. Whilst within Kampala, the city authorities collected a regular rent, the markets outside the city boundary

collected dues on items sold, in addition to a small charge for occupying the space in the market. The result of this is that the measurements are variable in time and, because of the differing procedure for collection of dues, in space. Secondly, Temple applied the measurement of stall numbers to the markets. Nakivubo comes out on top under this criterion (it is close to Nakasero, in the centre of the city). However, Temple makes the point that, although these data are accurate for inner city Kampala, they remain ambiguous elsewhere. Outside the city a seller may set up a pitch simply by paying his or her fee and unrolling a mat with goods. These were what the survey would count. This however, tends to omit intermittent trading and thus no account can be taken of the petty traders whose contribution is important, particularly outside the city boundary. Thirdly, physical size of the market place was used as a measure of size. This indicated a relationship between size of market and distance from the urban core, although some anomalies were recorded. This measure was not considered in any depth, but it was pointed out that this may have been deceptive because the physical size of the markets may not have been a good indication of the volume of goods passing through. Some markets located on small and apparently chaotic sites may in fact have a far greater turnover of volume than larger, more organised markets. This may simply be the result of necessity because of a large demand.

Finally, Temple examined the markets by level of consumption. He found that in the inner Kampala markets green vegetables and fruits of all kinds formed over 51 per cent of the value of commodities offered, while fresh meat formed another 41 per cent. In the markets of Mengo, Nakawa and Kawempe (outside the Kampala city boundary) non-perishable commodities formed the largest single group (33 per cent) of which much was charcoal. This was followed by *matoke*, the Ugandan staple meal (22 per cent), then beef and goat meat (22 per cent). Dried fish formed 10 per cent and green vegetables and fruit accounted for only 6 per cent. Temple points out that *matoke* is the most significant commodity in terms of income. These markets concentrate on different commodities and also offered a poorer quality and a cheaper equivalent to the inner Kampala markets.

Temple's description of the daily pattern of activity points to problems in data collection in such markets which he himself admits. Activity in the market places varies throughout the day reaching peaks at times such as at mid-morning, when most produce arrives from the central wholesale market, lunch-time, when workers enter the market in search of cooked meals, and between 4pm and 5pm, as people travel home from work. The last is particularly important where informal sector employment is common as these employees are often employed and paid on a daily, or piece-meal basis. The peaks in market activities may depend on the coincidence of both suppliers and consumers arriving at the market, for example *matoke* usually arrives in time for the 4pm to 5pm peak as workers return home. These variations make reliable measurements difficult to make. Temple also expressed his suspicion that the variety of peak

times throughout the day and in different markets suggested that the markets operated to complement each other in location, commodities and in peak hours.

The majority of market vendors were Baganda (60 per cent), the main tribal group in the city. There was a range of much smaller tribal groups, the main distribution of which reflected their residential distribution within the city. Super-imposed on this were certain tribal specialisms, resulting from tribal customs, dietary habits, control over supply of certain goods or contact with a certain group of consumers.

Dar es Salaam, Tanzania

Sporrek, in 1985 (although based on fieldwork carried out in 1976) identified the *duka*, or 'swahili' shop at the front part of a house with a rudimentary selection of goods, as the dominant selling outlet for food in Dar es Salaam. In 1973 it accounted for 90 per cent of food shops and 44 per cent of food traded in Dar es Salaam (at estimated retail prices). 50 per cent of them were run by people of Arab ethnic origin, while 29 per cent were held by Africans (Sporrek believed this signified an increase since Independence). Although the category "special shops, street and market sellers or producers" accounted for one quarter of all food marketed, Sporrek believed that street and market sellers were of strategic value. The food sold through them is the source of the population's protein, trace elements and vitamins. Also a significant number of the city population are employed and earning from this trading.

Sporrek argued that the location of selling points resulted from four main factors. The first of these factors is related to the location of the market places in relation to the distribution of the city's population. In the case of Dar es Salaam, the majority of the customers are private households distributed around the city. Secondly, a factor influencing the location of food trade is where the customers will eat. In Dar es Salaam it is common to cook and eat breakfast and the main meal of the day at home, while in other African cities, such as Accra (Lawson, 1971), it is more common to purchase cooked foods to eat in the market place or to take home to eat. It is interesting to note that Sporrek here dismisses the purchase of cooked meals in Dar es Salaam as insignificant. This he bases on personal communication with an economist of the university of Dar es Salaam [1]. However, based on observations and discussions with several researchers living in Dar es Salaam, reservations must be expressed of such wholesale dismissal of this form of food trading [2]. The social acceptability of purchasing cooked food (the basis of Sporrek's personal communication) only applied to people who were married or who at least had someone at home to prepare food. In addition, since the liberalisation of trading

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1 Personal communication with R Mabele, Director, Economic Research Bureau, University of Dar es Salaam.

2 Field observations and interviews with G Jambiya and D Mwamfupe of the Department of Geography, University of Dar es Salaam.

regulations within Dar es Salaam, the number of street traders has increased dramatically, including in their ranks large numbers of cooked food vendors.

A third factor of location is that most inhabitants of the city have low and relatively irregular income. Indeed in 1988 the minimum wage earner's wage was 29 per cent of its 1973 value when measured in terms of the quantity of maize it could purchase at the official price (Bryceson, 1990, p.9). Briggs (1990, p.191) reports that the minimum monthly wage in 1986 was TShs 860 and a middle range civil servant's salary was about TShs 2,000, which he compares with the cost of a stem of bananas at TShs 200 or a 4 gallon tin of rice at TShs 300. Those employed in the informal sector tend to be paid on a daily or piece-meal basis. This suggests that those with regular, but low formal sector income and those with highly irregular informal sector income, are limited to frequent purchases of food. In addition, it is likely that most have no facilities to store food at home, which is particularly important in Dar es Salaam's hot and humid climate, as this effectively eliminates the possibility of making larger purchases and storing. The result of these factors on the location of the markets is to ensure that they are easily accessible on the main commuter routes.

Fourthly, transport is important as a factor of location of food trade. In Dar es Salaam at that time buses were few, were generally unreliable, very expensive and served only some parts of the city. In 1976 Sporrek (1985) reported that 175 buses out of a total of 325 owned by Shirika la Usafiri Dar es Salaam were road worthy. These were serving a population of 600,000, who may have to travel up to 9 kilometres to work. Cars were and remain very expensive and generally limited to the more affluent sector of the population. Bicycles, although they would be ideal, were, and still are, in relatively short supply - as are spare parts for them. The remaining option is to walk, easily the most common method of movement about the city. The issue of the transport system is as important to consumers making their way to the market as it is to the retailers making their way to their market from the source of their produce. The transport system has improved considerably since Sporrek's survey and many people now travel by bus, but shortages of spare parts and increasing fuel prices can seriously affect the ability of the bus companies to maintain reliable services.

These four factors added up to create a relatively dispersed pattern of selling points, giving easy daily access to low to middle income residents travelling about the city on foot. The exceptions to the dispersed pattern are the higher class residential areas, where people generally go elsewhere (usually the city centre) to purchase larger and less frequent quantities of food, often by car. Two anomalies, however, appear. First, on the periphery of the city an unplanned, low-income residential area has a surprisingly low density of selling points for the concentration of potential buyers. Sporrek puts forward as a possible answer, that the inhabitants of the area are growing produce to meet their own needs. Secondly, in the city

centre there occurs an extremely high number of sellers for the relatively low resident population. The explanation for this is likely to be that this area has a generally high day-time population, with people commuting into the centre, thus increasing the potential day-time demand.

1.4 Discussion

In each of the three cases, referred to above, the researchers present graphic and sometimes highly detailed description and empirical evidence. There is, however, some difficulty in discovering any explanation in these studies. Each describes details and patterns of food retailing and marketing across their chosen city with reference to issues such as wholesaling, source of supplies, official versus unofficial supplies and fixed outlet versus mobile sellers. None analyse any of the aspects of food marketing raised in the four approaches described earlier in any detail. For example, only in Boekholt and van der Veen's (1986) study was there reference to the role of the various institutions in the supply process, such as traders or middlemen, but particularly producers. Even in this study there was very little detail provided about the roles of these groups in the food supply system and less data concerning their relative importance in the food supply chain. These groups are responsible for the movement and transfer of the food supplies and they are thus fundamental participants in any food supply system. It is of utmost importance, that their relative roles and priorities be assessed. Each of the three case studies above appears to be an attempt to freeze the food supply pattern in time, in order to describe it. As a result, this produces a detailed description of food marketing and consumption, which are ultimately lacking in any sense of change or development over time.

Boekholt and van der Veen (1986) conclude in their study that most of the vegetable retailing sector consists of 'informal' retailing, although they do not make it entirely clear what the distinction between 'formal' and 'informal' trading is. Sporrek (1985) is clearer, defining the 'informal sector' as market and street trade in the case of Dar es Salaam, characterised by factors such as ease of entrance, reliance on indigenous resources, family owned and small scale enterprise, intensive labour, little need for formal education and the sellers operating in an unregulated and competitive market. The *duka* referred to by Sporrek do not, he argues, correspond entirely to the 'formal' sector, characterised as they are by relatively difficult entry, by requiring capital to set up, and by being larger scale and far more regulated than the 'informal' sector. Sporrek goes on to elaborate on the relationship between the two sectors, describing them as complementary and mutually dependent, with goods transferring from one to the other and one supplying where the other does not (Sporrek, 1985). For example, Sporrek (1985) describes the Dar es Salaam marketing structure as contrasting with the structure described in many West African cities. *Dukas*, which concentrate on sales of processed foods and food products, such as cereals, bread, sugar, salt, tea, coffee, dairy products and sweets,

accounted for 44 per cent of total food turnover in the city in 1973. Shops specialising in one or only a few products (mainly meat), what Sporrek calls 'special shops', and markets, selling fruit, vegetables, fresh and dried fish, accounted for an estimated 20 per cent of the city's food turnover. Sporrek acknowledges that this figure is a rough estimate, but he does not attempt to separate these last two quite different categories.

In his recent review of the geographic literature on urban food supply systems, Drakakis-Smith (1991, p.52) identified two contrasting supply systems:-

1. "the petty-commodity sector which, as with all such activities, is organised not only to supply food to low-income households, but also to meet the demands of the urban market for low cost items, such as staples or fresh fruit and vegetables".
2. "the capitalist sector which usually comprises a combination of domestic and (increasingly) international interests involved in all aspects of the supply system *viz* production, processing, distribution and retailing."

The second sector has not penetrated the Dar es Salaam market to the extent of Drakakis-Smith's examples, such as Harare, Singapore and Hong Kong. He expects this sector to grow rapidly in most Third World cities in the near future. He also gives considerable attention to a particularly problematic aspect of the informal food supply sector, that of the production of food by urban dwellers in plots of land within the city or in the peri-urban fringe. This is a source of food which city authorities in many countries have often tried to play down, but which Drakakis-Smith argues, ought to be promoted "as much for its contribution to the social development of the city as for its contribution to the health of the household" (Drakakis-Smith 1991, p.60). Providing urban gardens gives the urban poor the means with which to feed themselves even if they are unable to obtain sufficient cash through employment. It also makes efficient, and more attractive, use of otherwise derelict land (see Rakodi, 1986; Sayeed, 1992; Sawio, forthcoming).

Although this may be an important aspect in the supply of fruit and vegetables in Dar es Salaam, due to the size of this subject it will not be specifically examined in this study. The various points of entrance of produce from this source onto the Dar es Salaam market will be referred to at relevant places in the discussion. This subject is covered in detail in an on-going study, the results of which appear elsewhere (Briggs 1990, 1991).

The three studies above represent a more case-study oriented approach in contrast to the theoretical approaches referred to earlier, in this chapter. Guyer in her criticism of the neo-classical economists, and the French and the British traditions, aims to integrate these

approaches to the study of aspects of society in an historical view. Bryceson (1985) sets out to do this in the case of Dar es Salaam, but while reconstructing the supply of food to the city over a long period of history, appears only to raise more questions. Temple (1969), Boekholt and van der Veen (1982) and Sporrek (1985) all set out to study their chosen cities based on field evidence through observation, survey questionnaires and official statistics. The danger in this approach, however, is to lose sight of the theoretical implications and simply describe a frozen, two-dimensional picture of a chain of food supply. It is not clear if there is any process of change,either long term or seasonal. The challenge for future researchers is to incorporate adequately the historical dimension of a food supply chain which is part of, acts on and is acted upon by the wider society, and within which people's livelihood and survival are at stake.

1.5 The Scope of The Study

The economic approach, characterised by Jones and the Stanford researchers, relies heavily on economic data alone, making little attempt to integrate historical and social analysis. However, economic data do provide a valuable base with which to complement the more qualitative data of social analysis. Therefore, economic data such as prices, volumes and market margins will be used as a part of the analysis of this study, which will have broader social interpretation. The social anthropological approach, characterised by the French authors such as Vennetier (1972), results in a large amount of detailed description and observation, and a focus on the role of the various institutions involved in the food supply systems, including the state. However, reviewers complain of a frustrating lack of focus, a lack of explanation, lack of a generalised framework and of the role of the state ironically not being covered in sufficient detail. Therefore descriptive detail should be incorporated into an overall framework which refers directly to the more quantitative analysis. The various groups and institutions participating in the system will be identified and incorporated into a general framework of investigation, but the role of the state should be examined in sufficient depth. In addition, the overall study should refer back to a more general framework of analysis.

The consumer-oriented approach, characterised by British authors such as Lawson (1967, 1971), concentrates on the impact of the marketing system on the consumer, and since the system is there to supply the consumer, this is an important point at which to assess its success. It tends to polarise political and academic stances, investigating the role of incomes in the relative access gained by different urban classes to the food supplied. Its aims are often described as narrow, if well-defined, studying the standard of living of the consumer classes, perhaps at the expense of other dimensions, such as the rural-urban divide. Finally, it is often accused of not taking into account a sufficiently long time scale. This study should therefore incorporate an examination of the relative access of different classes to the food market, within the more general issues. It should ensure, where the availability of data allows, the integration of an

historical dimension to the analysis. It will fulfil its objectives of assessing relative access within a broader set of aims concerning the overall food system and the other groups participating in it.

Any study of food marketing must therefore set out clearly the objectives and the focus of the research, and refer back to these throughout the investigation. It should incorporate the important elements of the approaches identified in this review, concentrating on only those relevant to the research objectives. It should also contain an explanation of its focus of research.

The focus of this research will be the fruit and vegetable sector in Tanzania. More specifically, it will examine the fruit and vegetable production and the rural-to-urban marketing linkages which bring this produce to the retail markets in the city. This focus has been selected for a number of reasons. Firstly, the 1976/77 Household Budget Survey of Dar es Salaam (Government of Tanzania, 1977) showed that 15 per cent of total household spending on food and drink was spent on fruit and vegetables alone. This demonstrates the importance of this sector to urban consumers. This importance may be under-estimated when one considers the consumption of informally obtained fruit and vegetables. Secondly, efforts are being made to encourage Tanzanians to increase their nutritional intake. One of the ways the state is encouraging this increase to be brought about is by the increased consumption of fruit and vegetables. This demonstrates the importance placed on these foods by the state and, if these efforts are successful, a possible increase in the demand for fruit and vegetables, not to mention the on-going increase in demand discussed above, as the result of the rapidly increasing population of Dar es Salaam. Several areas in Tanzania with favourable location for the production of fruit and vegetables and in relation to Dar es Salaam have become dependent on the continued production and sale of fruit and vegetables to the city's inhabitants. Clearly, this sector is important to the survival of some of Tanzania's rural fruit and vegetable supply areas.

Fruit and vegetables marketing and distribution have tended to fall between the remit of different government departments and agencies such as the Marketing Development Bureau, the Ministry of Agriculture and the National Food Strategy Unit, each of which is entrusted with the task of enabling and encouraging food production and distribution in Tanzania. These institutions have had other important priorities that have absorbed their limited resources, resulting in a paucity of established knowledge of the operation of the fruit and vegetables production and distribution system. This has equally been the case in the academic literature, with discussions on agricultural marketing focusing on staple foods and export crops (Ellis 1983, 1984, 1988; Griffiths, 1980; Raikes, 1986) and research on food concentrating on staple food (Bryceson 1985, 1987, 1990; Gordon, 1988). The Tanzanian Ministry of Agriculture, Food and Cooperatives is reported to have included specific sections on fruit and vegetable crops in

Tanzania's Second Five Year Development Plan (1969-74) in response to a speech by Julius Nyerere in 1969 in which he exlained the importance of fruit and vegetables to the nation's diet and economy, and how these crops were not being utilised to their fullest potential (Mlambiti, 1977). These sections did not have much real impact on the support for the fruit and vegetable sector. "Despite the importance of fruits and vegetables in the food profile of a country, data and information on the demand for and supply of these items are notoriously scanty in most African countries. The situation is only slightly better in Tanzania" (Mascarenhas, 1984, p.1). With this statement in mind, Mascarenhas, at a workshop on food self sufficiency in sub-Saharan Africa, argued that "...we cannot afford to carry on ignoring these two important elements of the national food basket" (Mascarenhas, 1984, p.1). Mascarenhas acknowledges the work already carried out in Dar es Salaam by himself and Mbilinyi on orange (Mascarenhas and Mbilinyi, 1971) and banana (Mbilinyi and Mascarenhas, 1973) marketing channels, and by Sporrek (1985) on more general retail patterns, and the efforts of Kariakoo Market Corporation (KMC) to try to record systematically statistics on fruit and vegetables sales. However, Mascarenhas and Mbilinyi's studies each concentrated on only one commodity and were based on field work carried out in 1969/70. Sporrek's fieldwork, carried out in 1976, concentrates on the location of retailing in the city. The KMC data has other problems which will be discussed in depth later in Chapters Three and Four, but briefly these record only what is received in Kariakoo Wholesale Market, where KMC admits it only handles a maximum of 60 per cent of the city's consumption (it will be argued later that in fact this proportion is much less). Mascarenhas describes these sources as " a start (in) the process of filling in a vital gap in Knowledge" (p.1) and " an important data base" (p.4). He goes on to conclude that "a survey of the fruit and vegetables in the rural and urban areas is urgently needed" (Mascarenhas, 1984, p.15).

The foregoing discussion has identified key actors in the urban food supply system, namely: state organisations, producers, rural traders, urban wholesalers, urban retailers and urban consumers. It has also identified key elements and issues important to the functioning of the system, namely: the political economy context, the cultural and social forces involved, the market economics, the relationships between the various actors in the system. Each of the approaches discussed above neglect one or more of the actors or issues listed, and all neglect the perspective of the producers. Few focus on the role of the private traders in the absence of state-controlled marketing boards, an issue of increasing importance in countries, such as Tanzania, where these institutions are currently having their activities restricted.

An assessment of the fruit and vegetable marketing channels requires an approach which addresses the relative roles of the public and the private sectors. This study will involve an analysis of the variety of regional origins of the commodities and of those groups and institutions involved in the marketing process, such as the state, producers, traders, consumers, transporters, and the marketing authorities. Some assessment will be made of the degree of

integration (both horizontal and vertical) within the marketing system; for example, the producers who transport and sell their own produce in Dar es Salaam, or, less formally, arrangements between the transporters and the traders in Dar es Salaam. An analysis of the variation in prices, volumes and market margins over time will be made, firstly, to assess their role and secondly to assess the development of the system over time. A second objective, concerning flows of information and the producers' decision-making, will be partly assessed by the analysis suggested above. In addition, some assessment of producers' priorities, and the motivations behind these priorities, will be carried out. Finally recommendations for the future management of the system will raise questions about the management of the system. For example, who should manage or control the different elements of the system, and how and according to what principles and priorities. This requires a review of the priorities of the system and what any form of management or intervention is intended to achieve. For example it may be to ensure efficient and comprehensive supply of food requirements which are accessible both in terms of cost (in relation to income) and in terms of physical availability. If this is so, what impact does this system have on the producing community and on the consuming community? How does it cope with surpluses or shortages? In what direction is it currently moving? Finally, the question of whether the system should be managed at all must be addressed, particularly if the results of the investigation demonstrate that the system survives regardless of state involvement.

Therefore the research objectives of the current study may be summarised as follows:-

1) To identify and analyse the fruit and vegetable distribution channels to Dar es Salaam, from producer to consumer.
2) To analyse market information flows to the producer and the extent to which these influence their decision-making processes in the producing areas.
3) To provide recommendations for the management of a more efficient food marketing system for Dar es Salaam.

This thesis attempts to analyse the system of supplying food to a primate city in a developing country. It presents the results of analysis of both primary data, collected by the author, and secondary data, obtained from other sources, and integrates them into a structure of analysis, which draws on a range of conceptual frameworks.

For this type of study the socio-economic and political context of the system under examination is of crucial significance to the historical and future development of the system. Chapter Two sets out to provide the context in which the Tanzanian fruit and vegetable production and distribution systems have developed. It will also set out the current agenda for the existing

government, giving background to the most recent changes likely to have impact on the different parts of the systems.

The supply of food in the case of Tanzania involves a wide range of strategies employed by the consumers for obtaining food and by the producers and traders for supplying food. This ranges from formal, state-controlled production, marketing and distribution, through to urban subsistence production and informal food exchanges. Obtaining meaningful data therefore can be problematic. This research set out to employ a variety of data capture techniques at as many points on the system of supply as possible given the resource restrictions, from rural production to urban retailing. The different areas of case study, as well as the techniques of data capture are described in Chapter Three.

As already described the food supply system involves a variety of supply channels. Chapter Four concentrates on an analysis of the formal sector of supply, using time series data collected from the company with responsibility for the regulation of the legal monopoly wholesale market in Dar es Salaam, the Kariakoo Market Corporation.

An analysis of informal sectors has the problem of a differential in the availability of data. In the case of the formal sector the regulating authority maintains statistics on supply, price and value of commodities passing through their control. Indeed, KMC has a Statistical Officer in its wholesale market, who proved extremely helpful in the collection of data for this research. This type of monitoring is of course lacking in the informal sector, where most participants are at least wary of anyone asking any form of question concerning their trading activities. In order to obtain a point of entry into the question of informal sector trading, a questionnaire survey of six retail markets was conducted. The analysis of this survey is presented in Chapter Five.

Chapter Six presents the analysis of a dataset compiled by a bureau of the Ministry of Agriculture and Livestock Development. This comprises a price survey of a selection of commodities in a selection of retail markets around the country twice every month. This is intended to provide an overall picture of the pattern of supply to Dar es Salaam. These retail prices are used in this thesis to produce an index of the price margins in Dar es Salaam's main supply areas. This index is then used to build a picture of the monthly geographical pattern of supply sources for the urban market.

The rural purchasing of fruit and vegetables is considered in Chapter Seven. This is done using the analysis of a series of interviews with a sample of wholesale buyers in Lushoto District, Tanga Region and focuses on the their motives and behaviour when purchasing fruit and vegetables to transport to Dar es Salaam. In Chapter Eight patterns of production in the rural study areas of Lushoto, Tanga Region and Morogoro, Morogoro Region are examined. This is

done by means of the analysis of a questionnaire survey of 271 producers of fruit and vegetables drawn from these two main areas. This survey is reinforced with detail from in-depth interviews of a small number of key informants. The different strands of the study will be drawn together in a broad discussion in Chapter Nine. This will draw overall conclusions on the development of the nature and pattern of fruit and vegetable production and distribution for Dar es Salaam. The final Chapter Ten will briefly present the study's ultimate conclusions and any recommendations for future monitoring and assistance of the system. This chapter will also set out areas for future research.

Chapter Two
The political economy of Tanzania since Independence

2.1 Introduction

This chapter provides a context for the study by reviewing the major policies, problems and events of the Tanzanian economy since the publication of the Arusha Declaration in 1967. There will be a brief description of the economic and political situation leading up to 1967, followed by an outline of the Declaration. The results of the adoption of the Arusha Declaration will be discussed, with an assessment of the relative impact of external factors, such as global economic variations and environmental changes, and internal factors, such as the implementation and development of government policy. A review of the literature will provide a critique of the policies and problems of the Arusha Declaration. The final section will highlight developments in the economy during the 1980s, focusing particularly on the changes to government policy in the light of the incorporation of International Monetary Fund prescriptions in Tanzania's most recent set of economic programmes (O'Neill, 1990). The chapter concludes with an assessment of the impact of these broad economic and political developments on production and marketing of fruit and vegetables for the domestic urban market, the subject of this study.

According Kaynak (1986) the level of economic development and the level of development of the marketing processes in a country are closely and causally linked. He demonstrates this by comparing classifications of Arab nations and finds that the most useful and accurate method of classification is one based on the level of development of their markets. He goes on to suggest that previous approaches to economic development, involving improved technologies, changing expertise or government control of the major means of production, did not address the key issues of development. "Marketing research methods and techniques prove to be the best means for determining the controlling factors of changes in the marketing environment" (Kaynak, 1986, p.162). In this statement Kaynak makes clear the interdependence between the economy, and by implication the political economy, and the marketing and distribution of commodities within that economy.

In Tanzania most of the distribution and marketing of food has been controlled by the government for most of its post-Independence period, and especially so after the Arusha Declaration in 1967. More recently, the government policy of socialist transformation has been abandoned and food markets, along with many other markets, have been liberalised. In the case of fruit and vegetables, however, little formal government control or support was effectively extended to their marketing and distribution. The fruit and vegetable production and marketing system, contrary to the experience of all other agricultural commodities, operated in a

relatively free market, the only restrictions being the establishment of regional trading corporations. These corporations were given monopolistic control of inter-regional trading not already controlled by the marketing boards. In Dar es Salaam the responsibility for fruit and vegetable marketing was given to the Kariakoo Market Corporation. In effect, this meant that legally all fruit and vegetable produce entering Dar es Salaam had to pass through Kariakoo Wholesale Market and be dealt with by one of Kariakoo's licensed independent dealers. No price controls were imposed, however, the only efforts to influence prices being the Kariakoo maximum and minimum guideline prices, which were not binding on the dealers, and which were frequently undercut or exceeded, depending on market conditions at any one time. The most recent developments in the political economy of Tanzania, namely the liberalising of markets, have resulted in the legitimising of the illegal trading of staples and fruit and vegetables. It is, as yet, premature to assess the effect of these changes, although Gordon (1988) has begun an assessment of the effects of liberalisation on the marketing of staple foods in Tanzania's main urban areas. This study attempts to assess the impact of liberalisation on the fruit and vegetable supply for the Dar es Salaam market. The following discussion presents the details of the political economic context for the development of the fruit and vegetable market since Independence.

2.2 Tanzania 1961 to 1967 - The Status Quo

Tanzania achieved independence in 1961, and for its first six years broadly maintained its colonial economic policies, although significant political changes were made. There was an active policy to increase the number of Tanganyika citizens in government and management positions. When the country achieved Independence "nearly three quarters of the middle and high level manpower positions in the civil service were held by expatriates" (International Labour Organisation, 1978, p.2). Tanzanian industry, which tended towards a policy of import substitution, experienced an investment boom, underwritten by an increase in personal savings encouraged by improved rates of interest offered by the banks. The banks offered improved interest rates in an attempt to reduce the flight of capital after the political uncertainty of early Independence (Loxley, 1979). A more likely explanation for the increased investment, however, is the large influx of funds from businesses already established in Kenya and Uganda. These investments were made by large Asian family businesses and some multinational companies in a move to spread their investments around the East African Common Market countries. This strategy was intended to spread risks in case the market broke up, as well as reflecting the potentially more acute political instability of Kenya and Uganda at that time (Coulson, 1982).

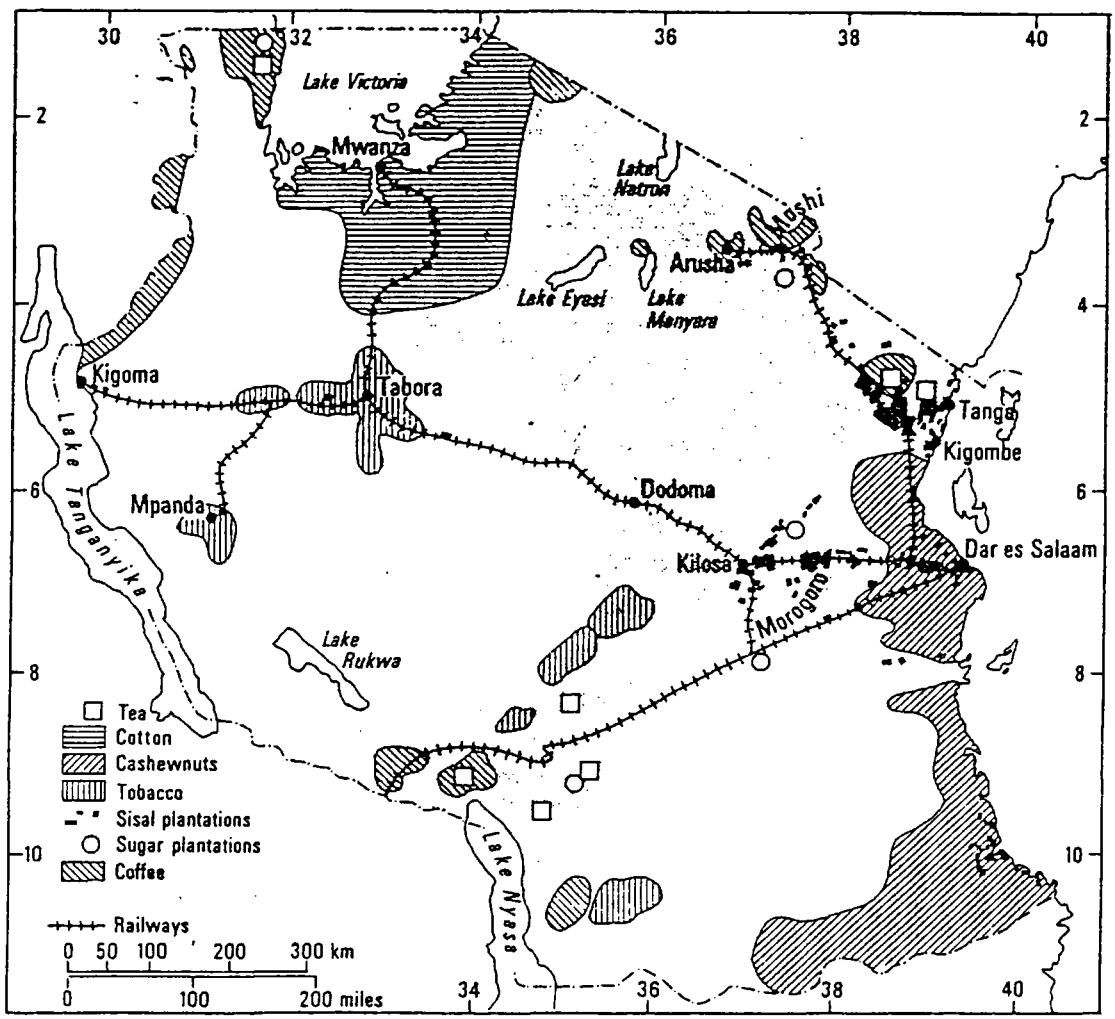
The exceptionally good performance of the Tanzanian agricultural sector in the early 1960s, which may have been exaggerated by the unusually good 1966 season, also contributed to the high levels of capital formation and of personal savings. However, investment from the other East African countries tended to be capital intensive rather than labour intensive (Green *et al*, 1980).

It generally took the form of mechanised final assembly industries, or of processing industries concentrating on imported raw materials, including metals, and various chemical products. However, the lack of integration and co-ordination which characterised the industrial sector, particularly between government interests in export production and foreign interests in imports before the mid 1960s, meant that some cotton used in Tanzanian textile factories was imported, while the locally produced raw cotton was exported (Coulson, 1982). The result was that, although Tanganyika exported raw cotton to the value of £6,794,000 in 1961, its gross textile output was only £212,000. The reason for this was a ban on the establishment of spinning mills imposed by the East African Industrial Council (EAIC), mainly influenced by two large spinning mills in Kenya and Uganda (Bierman, 1990). Until independence Tanganyika was considered to be an agricultural exporter only. This situation changed as the influence of the EAIC was lessened as a result of Tanganyika's independence and as the government set out to develop industry along import substitution lines.

Even before Independence, regional disparities were evident across the country. In terms of social trends, Woods (1975, p.41) identifies, what he calls the "historical development of 'area based' peasantries." He argues that colonialist penetration of African territories introduced a number of locationally focused economic activities, which altered the structural positions of individuals and groups within the already numerous and differing local societies. The locations of these individuals and groups in relation to the foci of colonial activities became important in terms of distance and accessibility to these new labour and agricultural markets. The imposition of taxes affected all, and was extracted in different ways. If employed or in business, income tax was taken; if producing for the market, levies were taken. However, the ability to raise taxes in different ways depended mainly on the climatic and environmental suitability of the area to produce the export or food crops demanded. According to Woods (1975), this divided the country into areas of net cash crop export, as the settlers established plantations in areas best suited for producing their desired export crops; net food crop exporting, as settlers or peasant farmers began producing food to export to the main urban centres of the country; or net labour export, as people left areas unsuited for crop production to work on the plantations. For example, areas such as Kigoma, Songea and Mtwara, which are distant from organised commodity markets and without a ready cash crop, became areas of net labour export, as people left in search of ways of earning cash. Areas such as Ulanga and Njombe Districts became both cash crop and labour export areas, depending on local and seasonal variations of climate (Woods, 1975). The highland areas nearest to Dar es Salaam, namely the Uluguru Mountains and the Usambara Mountains, provided the environment for temperate fruit and vegetables for the urban market, and hence became net food crop exporting zones.

Climatically, the highlands of the south, north and north-east are more suited for intensive agriculture. This can be seen in the patterns of the map in Figure 2.1, which shows the location

Figure 2.1 Map of the Distribution of Principal Export Crops *c.* 1967.



c. 1967 (Source: Berry 1971)

of export crop production. This resulted in them becoming export crop areas. These highlands were also the main areas of missionary activity for two reasons. Firstly they possessed cooler and more pleasant climates, with frequent and reliable rainfall, which attracted missionaries in the first place. Secondly, the more settled population which inhabited these areas made missionary work easier. As a result, the people of the highlands benefited from education, health provision and the experience of a more organised society, with the introduction of churches, parish councils, schools, other organisations and so on. This had the effect of making the highland population more receptive to the economic and political opportunities of more recent times. The main export crops are grown in clearly discernible areas of the country, partly as a result of the influence of the location of the early settlers. "Coffee is grown only in Kilimanjaro and Bukoba, cotton is grown only in Mwanza and Shinyanga. The pattern emerged early in the colonial period and has persisted for colonial reasons to the present." (Hill, 1975, p.223) Areas of net cash or food crop exports benefited from the income generated by the sales of these commodities. Their benefits were reinforced by the improved infrastructural provision and investment attracted to the crop exporting areas, in order to facilitate the easy exporting of the commodities, and by the other benefits associated with the missionary activity. By contrast the net labour exporting areas lost out as their labour, their only cash income generating resource, left in search of cash generating employment. Their environments and generally more dispersed settlement pattern made them unattractive for missionary work or infrastructural investment. This process fits closely to Slater's (1974) model of the process of integration and the spatial structure of underdevelopment. Slater describes the evolution of the spatial structure of Tanzania under colonialism, producing a typology of socio-economic zones, which he describes as follows: those areas which specialised in production for export; surrounding zones which supplied the export-producing regions with food and other services; and, finally, extending beyond these two zones, were peripheral zones, either supplying migrant labour or in near-isolation from the dominant areas. These zones identified by Slater, clearly were the fore-runners to Woods' area-based peasantries.

The main body of 'progressive' farmers were mainly in the cash crop exporting areas and the colonial government support for agriculture on the whole benefited these producers in these already well-developed areas. In addition to the economic and developmental advantages gained by the cash crop producing areas, Coulson (1982) reports that the senior positions in the government office have tended to be filled by people originating there, a further contribution to the process which Hill (1975) describes as 'economic stratification'. Hill further argues that the colonial system benefited areas that provided the ecological conditions to produce whatever it required. Those areas which were unable to produce what was required contributed their productive labour to the economy and received little in return. As Hill (1975, p.223) explains: "Areas that were ecologically unsuited for cash crop production were not ignored so much as they were exploited to sustain a colonialism of selective incentives. Such

regions paid more than their fair share of taxes and received far from a commensurate return in government services."

This colonial legacy has been played down by the post-Independence government, perhaps for fear of similar tribal troubles, which have affected Tanzania's neighbours and which may result from favouring tribes in some areas at the expense of others. The government has set out explicitly to try in some way to redress the imbalance, although it is still argued that many of the top positions are held by people originating from the advantaged areas and this has an implicit effect on the directions of government investment.

The period from Independence to 1967, can be characterised as a period during which the government tried to establish its main priorities. It inherited a legacy from colonial times of large plantation agriculture and a small industrial import substituting sector. Politically it wanted to shift the investment balance towards the rural peasantry, but economically it needed the foreign exchange generated by the economic structure established under colonial rule. Agricultural policy was focused on the developed sector, identifying 'progressive farmers' and large scale agriculture for support, in order to boost export earnings, most of which were generated by the export crop production. There was some divergence between the motives of the various groups involved in governing and administering the country. On the one hand the middle and upper level civil servants had strong nationalist sentiments, but were against any changes which may jeopardise their position. On the other hand the TANU Party ideologues, led by Nyerere, were beginning to express their socialist sympathies. Shortly after Independence, Nyerere resigned from office in order to write a number of Party discussion documents and papers. These covered his thoughts on the future of education in Tanzania and the role the co-operative movement could play in a newly independent Tanzania. The thinking and writing Nyerere did during these months formed the basis of the Arusha Declaration which was adopted by TANU in 1967.

2.3 Tanzania 1967 to 1980 - Socialist Transformation

On 5th February 1967, after much discussion and the final approval of the National Executive Committee of the Tanganyika African National Union (TANU), the Arusha Declaration was published. The underlying theme of the Declaration was the proposal of a philosophy of development based on the needs and abilities of the mass of rural producers. The people were seen as Tanzania's greatest resource and as 90 per cent of them lived in rural areas: "...the land is the only basis for Tanzania's development, we have no other" (The Arusha Declaration, quoted in Okoko, 1987, p.85).

This was a radical policy based on a combination of socialist and traditional African principles (although a challenge to the validity of this basis is discussed later in this chapter: Lofchie, 1978; Connell, 1974; Sender and Smith, 1986). It set out to stimulate productive forces in peasant

agriculture and to enhance political participation by the peasantry, so as to improve their material and cultural well-being and to contribute resources for national development. The Declaration sets out four main policies. Firstly, it sets out its intention to transfer to public ownership all major means of production and exchange. Secondly, rural and agricultural development was to be coupled with a movement towards rural socialism that stressed the building of *ujamaa* villages (defined as co-operative and communal), rather than state farms or estates or individual peasant farms. Thirdly, it included a new educational policy fitted to the framework of socialism and emphasising primary education and education better suited for rural existence. Finally, the Declaration set out a policy of self-reliance with respect to the international economy.

The adoption of this document by TANU, and its subsequent publication, was to prove a turning point in Tanzania's history. The policies contained in the Declaration were not revolutionary, but they flowed out of government thinking since Independence. However, the national popularity of the ideals of the Declaration and the response from governments and interested individuals and organisations abroad made the Declaration into an historic document.

> "Before the Arusha Declaration, Tanzania was an ex-colony, much like other ex-colonies in Africa. After the Declaration, rightly or wrongly, it was frequently listed alongside Cuba, North Korea and North Vietnam. While such comparisons were obviously premature - as Nyerere himself pointed out - the Arusha Declaration was undeniably a step in the direction of socialism."
>
> (Coulson 1982, p.176)

Coulson argued that Nyerere's critics, and even Nyerere himself, were surprised how popular the Declaration was to become, both in Tanzania and among foreign academics (Loxley, 1979; Coulson, 1982; Yeager, 1982). Dominant bureaucrats and Party leaders, who had reservations about socialism, were persuaded of the value of the Declaration through their nationalist concern and by its commitment to taking public control of the main means of production. They felt that the public ownership of the main industries was a "legitimate means of combating the threat to the independence of the nation, which reliance on foreign governments and foreign businesses seemed to pose by their failure to provide capital and jobs in Tanzania" (Loxley, 1982, p. 79).

Parastatal organisations were seen to have a crucial role to play in the practical workings of the policies of the Arusha Declaration, these organisations being government-owned industries and institutions, such as banks, insurance companies, and public utility companies. According to Coulson (1982, p. 274) they fulfilled three roles. The parastatals were expected to limit transfers of profit out of the country; they were expected to invest in productive sectors of the economy, especially manufacturing, but also agriculture and tourism; and, finally, they were expected to strengthen the productive infrastructure, especially through investment in transport, construction and power generation. The National Milling Corporation was therefore given responsibility for purchasing from producers at government-set producer prices,

investing in some production, transporting staple foods to areas of deficit and selling at government-set retail prices.

The day after the Declaration was published President Nyerere announced that all the commercial banks in the country were to be nationalised. Within a week eight firms involved in grain milling and the six largest import-export houses were also nationalised (Coulson, 1982). In 1967 there were 64 parastatal organisations; by 1974, after nationalisations and some consolidations, there were 139. However, although firms were nationalised, this did not mean complete takeover, but a partnership between the National Development Corporation and the original foreign firm. For example the National Development Corporation has a 50 per cent holding in the Metal Box Company of Tanzania Ltd., the foreign partner being Metal Box Company (UK). The National Development Corporation also holds a 50 per cent stake in Tanzania Publishing House, the partner being Macmillan and Company, and the NDC holds 60 per cent of BAT Tanzania Ltd., in partnership with British American Tobacco Company Ltd. (Nursey-Bray, 1980). Nyerere promised full and fair compensation for all the assets acquired by the government, and Scandinavian auditors were provided to assist the Tanzanian treasury in scrutinising claims for compensation from nationalised banks (Crouch, 1987).

It was expected that public ownership of the production corporations would help the policy of self-reliance. Despite this policy, however, even in the publication of the Second Five Year Plan in 1969, foreign aid was acknowledged to take an increasingly large part of the nation's income. The proportion of the development budget received from external sources increased from 35 per cent during the First National Development Plan (although it was planned to be 78 per cent), to 48 per cent during the Second National Development Plan (although it was planned to be 43 per cent) (Resnick, 1981). Annual foreign borrowing and aid grants increased from US$ 75.8 million in 1967 to US$ 238.4 million in 1975. By 1979, this official development assistance had gone up to average approximately US$ 588 million per annum, such that in 1980, Tanzania was in the "top two or three countries in Africa south of the Sahara in terms of receipts of non-military 'aid' per capita" (Coulson, 1982, p.301) Svendsen (1986) argues that the policy of self-reliance was more the expression of a wish to define the priorities for development, rather than having donors define them, and that it was only over the long term that external sources of income were to be reduced. He cites Tanzania's protracted discussions with the International Monetary Fund (IMF), even in the face of national economic crisis, from 1980, when the agreed ceilings on government expenditure were exceeded, until 1984, when the government devalued the shilling to $1 = TShs 17, thus meeting part of the IMF's conditions (Bevan *et al*, 1987). An agreement with the IMF was finally signed in 1986 (Ellis, 1988). During this time the Tanzanian government and the IMF argued over producer prices for export crops, the principle and practice of devaluation of the Tanzanian Shilling and the level of interest rates.

Most significantly, however, the Arusha Declaration advocated emphasis on the development of the rural sector, as this contained the vast majority of Tanzania's population and also produced the bulk of the nation's wealth. The following discussion will consider six main issues raised in the literature in relation to the Arusha Declaration and its impact on the rural agricultural population: the policy of self-reliance; the philosophy of communal - or *ujamaa* - socialist villages; the villagisation programme; the issue of class; the results of, or the impact on, agricultural production after the Declaration; and the spatial dimension of the Declaration's implications. In addition, the influence of the Arusha Declaration on the policies of agricultural marketing will be discussed. Finally, the results of the Declaration and subsequent policies will be assessed, by examining briefly the effect on the economy between 1970 and 1980.

In spite of the stated emphasis on national self-reliance, Coulson (1982) and Svendsen (1988) both point out that Tanzania's economic policies were not developed in isolation. Svendsen argues that adjusting official foreign assistance to account for increases in import prices, shows that Tanzania's foreign aid increased by 500 per cent in real value between 1970 and 1980. This, he argues, indicates Tanzania's wish to remain self-reliant in prioritising expenditure, but , naturally, willing to accept assistance. However, Coulson (1982) points out that shortly before TANU's adoption of the Arusha Declaration, negotiations with Tanzania's three most important donors, the United Kingdom, Germany and the United States of America had broken down. It was therefore politically inevitable that her policy documents would incorporate a more 'self-reliant' outlook, even if this was not what occurred in practice, or even what was intended in private.

Okoko (1987) argues that Tanzania cannot avoid the need for external trade and aid, but if it is to continue on the socialist path, it should select its partners accordingly. This means dealing with partners who will either encourage the development of socialism, or those who will allow Tanzania to develop in its own direction. In view of recent events in Eastern Europe, and in view of Tanzania's experience since Independence, neither of these options is likely. What is clear, however, is that Tanzania's ability to trade in the international market is crucial to its ability to achieve any form of sustained economic or social development.

Coulson (1982) argues that agricultural settlement schemes set up under the government's 'transformation' approach to rural and agricultural development did not work because of low commitment to the schemes from those involved and, therefore, the work input from the settlers was low. In a speech as early as 1968, Nyerere accepted that mistakes had been made in its previous approach to settlement schemes. "What we were doing in fact was thinking of development in terms of things, and not of people." (Nyerere, 1974, p.36) Nyerere argued that in very few cases was any form of ideology involved and that the new policy of *ujamaa* villages is not the old policy under a new title, but a new conception, based on the post-Arusha Declaration understanding that what should be developed is people, not things, and that people can only develop themselves. The communal basis for *ujamaa*, as Nyerere

saw it, was "a voluntary association of people who decide of their own free will to live together and work together for their common good." (Nyerere, 1974, p.37) The concept of *ujamaa* is linked by Nyerere to traditional African values of familyhood, equity, hospitality and responsibility. According to Nyerere, this linking of the communal basis to a committed voluntary rural population was what would make *ujamaa* work, where the previous settlement schemes had failed. A questioning of this basis comes from three directions.

Firstly, Lofchie (1978) questions the claim that community is a concept native to the African continent. He argues that the Tanzanian government's reversion to the use of force to form *ujamaa* villages is proof that this policy is inappropriate. Connell (1974) and Ergas (1980) set aside this question of *ujamaa's* roots to point out that the use of such a blanket policy, with little in the way of detailed guidelines, is not appropriate to the highly mixed social and physical environment of Tanzania. Connell (1974) questions such a blanket policy when enormous variations exist across the country. He points out that the country has 120 tribes of very different sizes and which are at different levels of development and assimilation in the market economy. The country has a mixture of varied ecological circumstances and agricultural systems, with very different potentials and carrying capacities, and a combination of different kinds of subsistence and commercial agriculture. "Local situations are quite different and it would be improbable that the same kind of cooperation would be generally suitable" (Connell, 1974, p.17). To take extreme examples, the form of cooperation developed by a pastoral area would have to be different from the form of cooperation in a semi-arid environment, not simply because of the differing ecology, but also because of the differing social and economic relations which will have developed in these areas over time. However, this was already accepted by Nyerere in a section of Socialism and Rural Development, entitled "No simple or single answer for all circumstances." (in Cliffe *et al*, 1975). Nyerere points out that "...it would be foolish for someone in Dar es Salaam to try to draw up a blue print for the crop production and social organisation which has to be applied to every corner of our large country ... Principles of action ... must take into account the different geographical and geological conditions in different areas, and also the local variations in the basically similar traditional structures... Local initiative and self-reliance are essential" (Nyerere, 1975, p.11).

What Connell (1974) seemed to be arguing for was some degree of flexibility within the *ujamaa* system. This seems to be what Nyerere was also arguing for in a 1968 speech, when he explains the importance of the members of the *ujamaa* village to decide their own priorities. "They and no one else will decide how to use the money they earn jointly - whether to buy an ox-plough, install water, or do something else. They and no one else, will make all the decisions about their working arrangements." (Nyerere, 1974, p.37) However, this required a significant degree of motivation and commitment from those who have decided to form an *ujamaa* village. This is a point Nyerere felt was important. "Unless the purpose and socialist ideology of an *ujamaa* village is understood by the members from the beginning - at least to some extent - it will not survive the early difficulties." (Nyerere, 1968, p.37) "No one can be

forced into an *ujamaa* village and no official - at any level - can go and tell the members of an *ujamaa* village what they should do together and what they should continue to do as individual farmers." (Nyerere, 1968, p.36) Clearly, the type of committed communal unit Nyerere argued for in this booklet was dropped when the enforced villagisation programmes began. At the early stages of the promotion of *ujamaa*, many of the dangers of enforced blanket national settlement schemes had been addressed by Nyerere. What must be concluded is that the policy of *ujamaa* was dropped in the rush to form villages during the early 1970s. The voluntary and committed participation in the rural productive process through democratically agreed cooperative and communal production arrangements, which were crucial aspects of *ujamaa* policy, were no longer an element of the villagisation campaign.

In addition to this, Briggs (1980) argues that the physical and spatial aspects of villagisation were disregarded. The emphasis was placed on clustering the population to enable the government to provide basic needs and services and this took place at the expense of production. Farmers were moved to live much greater distances from their land. Settlements were located giving no consideration to the type or quality of the surrounding land. This went further with the government dictating the type of crops to be grown in certain areas, rather than relying on economic incentives to encourage certain crop types and ignoring Nyerere's statements quoted earlier. The subsequent government failure to provide the promised seeds, inputs, crop prices and credit, as well as in some cases the health, education and consumer goods, produced an apathy within the peasantry towards the production of cash crops (Hill, 1975). Many reverted to subsistence production or producing for the black market, resulting in a massive fall in cash crop and food production sold through the formal market channels and disillusionment among the rural producers. What is interesting, however is that many of the original villages have remained together. Even in situations where villages have not stayed together, they have tended to form smaller, more ideally located satellite settlements around the original village location. [1]

Ergas (1980), on the other hand, makes the distinction between economic and social behaviour. He argues that in the process of 'modernisation' economic behaviour is more susceptible to radical change. Social behaviour, which responds to need, is likely to be more resistant. Thus the more productive areas, such as the central northern and coastal areas for the production of sisal and the highland areas of Kilimanjaro for coffee, which have had greater contact with the colonial cash economy, have become economically more individualist, competitive and profit-oriented. The more marginal areas, whose first contact with 'modernisation' was communal settlement schemes, are more likely to adapt their economic behaviour to fit. From the villagers' perspective, the marginal settlers are more likely to see benefit in cooperative activities, whereas the already successful private producers are more likely to see disadvantages.

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1 From a discussion with Mr G Jambiya, University of Dar es Salaam.

Briggs (1980) and Raikes (1986) identified heavy-handed use of compulsion and regulations to 'encourage' peasants to move into villages. These were seen to have a short term negative effect on agricultural production and also on the villagers willingness to adopt communality, which became politically linked with enforced villagisation. This in turn relates to the theory that villagisation was a policy to enable the government to meet its promises on the provision of services, on the one hand, and the setting up of an infrastructure to control the peasantry on the other. Both have been at the expense of production. Other factors such as pricing policies, or the failure to provide inputs compounded and aggravated the problem.

Hyden (1980) and Okoko (1987) see the problem of *ujamaa* as lying in the fact that the Declaration did not tackle the question of class and class conflict. The problem of the regional differential in the levels of development already achieved by the time the villagisation policy was brought into effect, is reflected, according to Hyden (1980) and Coulson (1982), in the different types of response that villagisation received. Coulson argues that three distinct types of village were created as a result of the villagisation policy. First, the early villages such as those under the TANU Youth League or the Ruvuma Development Association, which were highly politicised and committed to making the villages work. Second, there were villages set up in order to obtain the aid on offer, or to gain access to land in areas of high population density. In some cases these villages ran estate workers off land and encroached on reserved forest land (Raikes, 1979). These villages have little commitment to the communal aspects of the village settlement campaign. Finally, there are those villages formed by various government and Party 'operations' many under the threat, or indeed the use, of coercion, regardless of the motivations of the village 'participants' (Coulson, 1982).

In the three types of village described above there are two conflicting flows of motivation, in terms of the class structure within Tanzanian society. In the first case there is a definite 'grass roots' organisation in the form Nyerere may have originally intended. This involves village members in empowering their lives by taking an active part in the life and development of the village through the communal tasks they carried out. In the second case the village members band together in an opportunist coalition to take advantage of the prevailing policy in order to accrue personal gain. Coulson reports that the communal element of these villages did not exist beyond what was required by the village settlement regulations. The advantages obtained by these articulate, progressive 'peasants' were often gained at the expense of other, less fortunate individuals, usually estate employees or landless labourers.

Okoko (1987) argues that the Arusha Declaration in particular, and Tanzanian policy in general, does not challenge adequately the power of the bureaucratic class as distinct from the Party ideologues. The bureaucrats were essentially against communal production, socialism and self-reliance. Okoko argues that the lack of socialist guidelines for the management of the economy and business, therefore, has allowed this class to entrench its privileged position in society,

and this has undermined the achievement of the goals of the Arusha Declaration(Coulson, 1982; Connell, 1974). This is particularly obvious in the case of the acceleration of the villagisation campaign into the operations of various branches of the government and the Party. Coulson (1982) suggests that the initial aims of Nyerere and his fellow theorists were hijacked by bureaucrats in the government and senior party officials, who saw the villagisation programme as an ideal way in which to gain a greater control over the large dispersed rural population. This hardly seems surprising as some of the top party cadres increasingly looked towards, and indeed were trained in China and North Korea, for example, where rural development was practised in this way with the notion of 'party supremacy'.

Coulson points out that there was a lack of planning and assessment of the impact of the villagisation on such things as the agricultural production, soil conservation, farming practices (especially those developed to suit a dispersed settlement pattern), building construction, property protection and the spread of disease. This lack suggests that the rural population's priorities were not paramount in the planning of the accelerated villagisation operations, and that other motivations were at stake. The main ones to which Coulson is prepared to give credence are to do with the economies of scale in health and educational provision. The grouping of the rural population made the ambitious promises of primary health care and education for development for the Tanzanian people more economically viable. However, the lack of account taken of the impact on production resulted in a fall in cash crop production and increasing food insecurity, leading to the increased importation of food and greater dependence on foreign aid and grants. Clearly this was contrary to one of the pillars of the Arusha Declaration, that of self-reliance.

Lofchie (1978) and Briggs (1980) both reported that the operation to move the entire rural population into villages, begun in 1971 and peaking, with an estimated 7 million people 'villagised' in 1975, disrupted agricultural production. Lofchie claims a direct relationship between the application of *ujamaa* and the increase of the food crisis. Briggs (1980) refutes this, pointing out that the principles of *ujamaa* had been dropped from the villagisation programme three to four years before the peak of the agricultural disruption, in 1975-6. This is confirmed by the fact that of the first type of village described, the highly politicised *ujamaa* village, almost all were registered before the end of the 1960s. Evidence presented by Raikes (1979), Briggs (1980) and Coulson (1982) indicate that the number of fully communal villages which closely followed *ujamaa* principles, were so few as to be unable to have the impact on national agricultural production with which Lofchie credits them. It was, therefore the trauma caused to the rural population by the enforced villagisation programme, and not *ujamaa*, which caused the drop in Tanzanian agricultural production, in both food and cash crops, such as sisal, coffee and cashews. This was further exacerbated by the drought, which affected most of sub-Saharan Africa.

The issue of class has already been discussed above. However, Connell (1974) suggests further that some progressive farmers were able to use the villagisation programme to their advantage and some moved out of agricultural production and into cooperative management. This, in effect meant that highly productive farmers were encouraged to stop producing and to move into activities which were not directly productive (Ergas, 1980). Examples of this are to be found in the plethora of new Party and government positions opened up by the decentralisation of the government apparatus, forming a hierarchy of Ten-Cell Units (organisational units of ten families), Wards, Villages, Divisions, Districts, and Regions and also some marketing cooperatives.

In the colonial period the marketing of export and food crops was the responsibility of private traders, licensed with the colonial authorities. However, as the colonial government only generally licensed one trader for each region, there was little competition. During the 1950s, the government licensing became less rigid, and competition was allowed. Marketing cooperatives began to emerge, and these were encouraged by the colonial government as a way of supporting commercial peasant production, "while diverting the energies of rising Tanzanians away from politics" (Raikes, 1986). The Independent government saw the cooperatives as a means of implementing their development programmes. The cooperatives, which had already been given statutory monopolies for the purchases of crops in their areas, began to be given additional responsibilities. The nationalisation of wholesaling incorporated them as official state buying agencies, they were given the added role of administering aid grants, operating tractor services, and providing other services defined for them from above. Their inadequate accounting systems and the lack of training of their members, resulted in widespread mismanagement and corruption. In 1975 the cooperative unions were abolished in favour of crop authorities, which also replaced the former marketing boards. These authorities were given full responsibility for the production and marketing of a specific crop, although in the case of the National Milling Corporation, it was also given responsibility of all the grains and of famine relief programmes. These authorities were also given responsibility for extension advice, financing, input distribution, grading, procurement from villages throughout the country, storage, transportation, processing and marketing. The crop authorities were not efficient and became increasingly expensive to run, registering a combined loss of about TShs 5,000 million by 1981 (Katona, 1988). Where the previous cooperative unions had been area-based they were able to fulfil their transport and purchasing responsibilities, relatively easily. The new authorities had to provide transport, buyers and administrative staff for each area in which their crops was produced, often resulting in overlapping provision. The increased numbers of administrative staff required and lack of appropriate qualifications diluted the available skilled workforce and resulted in poor administration, poor maintenance of vehicles and machinery, delayed crop collection and payments, inappropriate grading of crop yields, delayed and untimely delivery of inputs and poor support of extension services, which had been taken over from the Ministry of Agriculture.

Katona (1988), in a review of agricultural policies in Tanzania contrasts the stated aims of the Arusha Declaration of developing the agricultural sector with the systematic reduction in funding and investment in the sector, while at the same time increasing the burden of taxation borne by the sector. In Table 2.1 Katona compares the proportion of stated development budget in each development plan which was to be allocated to the agricultural and the manufacturing sectors.

Table 2.1 Development Budget Allocation of Agricultural and Manufacturing as a Percentage of the Whole in the Mid-Term Plans of Tanzania.

Sector	Three Year Plan	First Five Year Plan	Second Five Year Plan	Third Five Year Plan
Agriculture	24.0	5.9	23.1	14.9
Manufacturing	4.6 [a]	13.6 [b]	1.2 [c]	24.2

Source: Katona, 1988

a. Figure contains also the development of commerce.
b. Figure contains all the industrial branches and energy.
c. Figure contains all the industrial branches and commerce.

Although the manufacturing figures are not entirely compatible, what is clear is the oscillating trend in the two sectors and the overall increasing trend in manufacturing and decreasing trend in agriculture. Katona (1988) goes on to report that between 1970 and 1980 the overall gross marketing margin for agricultural crops increased by 652 per cent while the producer value grew by only 127 per cent. In addition, taxes, expressed as a percentage of total sales value, rose during the 1970s from 6.5 per cent to 19.9 per cent. This squeezing of the peasantry through dwindling resource allocation, on the one hand, and intensified surplus extraction, on the other, appears to have been recognised more recently. "Since the early 1980s, the Government has continuously raised the share of agriculture in its development expenditure: in 1982-83 it was 12.7 per cent, in 1984-85 to 1987-88 it has been constant at 30 per cent." (Katona, 1988, p.147).

In 1986 a new cooperative marketing system was introduced on a similar basis to the one which was dissolved in the early 1970s, whereby the local village-based primary cooperative societies are responsible for the purchases of the crops in their area and selling them to the relevant crop authority, marketing board or directly to the processing factory. The co-operative societies' role has not been entirely made clear, although they have been given responsibility for crop purchases, they are also expected to have additional roles, such as adopting and running the village communal farms, which had been unsuccessful under the villagisation programme.

Lofchie (1978) argued that the low food production, which caused the 1974/75 crisis, came about as a result of the inhibition of the producers' individual motivation to produce as a direct result of the *ujamaa* policy. Raikes (1986) however, warns that official production figures are generally

based on marketing authority purchases. This, unfortunately, does not include subsistence production and what has become euphemistically known as the 'informal market', that proportion of food produced outwith subsistence and sold outwith formally marketed channels. This element of produce distribution has become more important recently, but because there are no figures available assessment of this can only take the form of estimates and impressions (Gordon, 1988). However, an indication of the importance of the informal market can be gained by considering the fact that most of the imported food is distributed in the urban areas, and predominantly to the Dar es Salaam population, while starvation or famine in the rural areas has been to a large extent avoided (Bryceson, 1990).

Sender and Smith (1986) have argued that the concentration on food production in order to maintain and increase economic self-reliance is erroneous for three reasons. This concentration may result in a reduction of overall economic consumption, because the food would have to be obtained at higher than necessary domestic resource costs. Historically, rapid economic growth can be associated with rising food imports (they quote Kenya, Nigeria and the Ivory Coast as cases in point.) Where emphasis on food production causes reallocation from production of other goods, this may result in forfeiting self-reliance for these other goods. Where these other goods are important elements of the economy's infrastructure, such as machinery, lorries, medicines or chemicals, this may leave the economy more vulnerable. By not concentrating on export production the economy is not generating foreign exchange with which to import such goods.

Okoko (1987) has argued that the continued and increased foreign aid to Tanzania has tended to extend foreign influence, control, technology and decision-making into the national economy. Since the goals of foreign interest have tended not to be in line with the Arusha Declaration this has perpetuated underdevelopment within the country. He substantiates this by pointing out that aid given by donors is rarely, if at all, given for purely altruistic motives. It is usually granted to gain strategic advantage, conditional on political or economic sympathy, or with strings promoting exports from the donor. Tanzania has a number of important examples when actions it has taken, which were disliked by aid donors, were penalised by cuts in aid. For example, Britain froze £7.5 million in aid as a result of diplomatic dispute between Britain and Tanzania after the Unilateral Declaration of Independence by Rhodesia (now Zimbabwe) in 1965. Assistance from West Germany was curtailed in 1965, when Tanzania refused to close down its East German consulate in Zanzibar after the Tanganyika-Zanzibar Union. The USA withdrew the large cohort of Peace Corps working in Tanzania, particularly in education, when various branches of the Party criticised the USA, and accused it of being involved in a coup plot against the newly formed Nyerere government.

Almost all the literature has pointed to the large, inefficient crop authorities and other parastatals as having a significant negative effect on official purchase figures. Raikes (1986)

describes a situation where producers in Arusha, the main maize growing area, began selling maize 'unofficially' across the closed Kenyan border from 1979.

The importance of considering geography when evaluating the impact of the Arusha Declaration on Tanzania has been referred to above. The social and economic environment varied regionally before independence. The different areas of Tanzania responded differently to the various policies, incentives, opportunities and restrictions. Connell (1974) particularly pointed to the rich regional diversity of Tanzania and suggested that perhaps the problem which *ujamaa* socialism did not consider was that it expected uniform committed response particularly from the peasant farmers. As we have already discussed above, the diverse social, economic and agricultural conditions responded to the equally diverse manifestations of the *ujamaa*, then villagisation and, finally, coerced village settlement.

Table 2.2 The Number and Population of Registered Villages in Tanzania

	1971	1972	1973	1974	1975	1976	1977
No of Villages	1,956	4,484	5,586	5,628	5,008	n/a	7,684
Population of Villages	0.53m	1.55m	1.98m	2.03m	2.56m	7.0m	13.0m (90%)

Source: Briggs 1980

The beginning of the 1970s saw a consolidation of the Arusha policy. 'Ujamaasation' continued on a voluntary basis, although the pace brought frustration to some government officials and Party members. In 1969 the President ordered government departments to give priority in spending to villages in an attempt to encourage their formation. During 1970 and 1971 *ujamaa* became a top priority, for the central organisations of the Party and the state. As Hill (1975) described, these efforts focused on Dodoma Region, where Nyerere hoped to show that rural socialist transformation would increase local production in a region which was marginal to the national economy. In March 1970 Nyerere ordered that the entire population of the Region should form socialist villages within 14 months. The government began encouraging the formation of *ujamaa* villages, but dropped this to invest its resources simply in the formation of villages. 'Operation Dodoma' used a certain amount of force in 'helping' peasants to form villages. The use of force spread, particularly after 1973 when the government committed itself to having the entire rural population 'villagised' by 1976. In 1973 the villages were described as 'planned villages'. The notion of *ujamaa* was dropped and villagisation was described as an interim step towards *ujamaa* socialist villages. Table 2.2 demonstrates the acceleration in the formation of registered villages, so that by 1977 90 per cent of the rural population had been moved into registered villages. In 1974 and 1975 the country experienced a drop in agricultural production. This was blamed on the oil price increase which occurred at about that time and there was a drought across the whole of Sahelian Africa in 1973-75, which was claimed to have stretched to Tanzania. Rainfall figures do not bear this claim out (Coulson, 1982) and the reality

is that the massive disruption of the villagisation programme had a serious detrimental effect on food production (Briggs, 1980; Coulson, 1982). This meant a large importation of food and this, together with the drop in agricultural export crops, tipped Tanzania's balance of payments into deficit.

In 1975, Tanzanian policy moved towards increased investment in industry. Manufacturing investment accounted for 10-15 per cent of planned expenditure in 1970, but had increased to 35-40 per cent by the end of the decade. This investment was intended to increase domestic production of commodities which, until then, had been imported. In agriculture, the government increased producer prices for the main staple grain foods, but it is argued that concurrent increases of producer prices for export crops were not sufficiently high to stipulate production (Sharpley, 1985). The support of food crops was part of the emphasis placed on self-reliance, which expected that a concentration on domestically produced food would result in reduced imports.

There was some alleviation of Tanzania's economic problems because of a frost in Brazil in 1975, causing a global shortage of coffee and increasing coffee prices by a factor of three between then and 1977. This drop in supply from Brazil resulted in increased coffee purchases from Tanzania. All Tanzania's main export crops experienced rapid rises in price in the second half of the 1970s, with cashewnuts increasing by 16.2 per cent, coffee by 14.2 per cent and tea by 12.2 per cent. However, Tanzania was unable to take full benefit of these improved international economic conditions because its overall terms of trade had not recovered since the 1974/75 crisis. The main problem was a shortage of foreign currency and this was further exacerbated by the optimism of official estimates of the results of the policy of food self-sufficiency, which led them to underestimate the foreign exchange requirement for the late 1970s (Sharpley, 1985). In addition, the increased attention paid to manufacturing and industry, as well as the on-going expansion of education and health provision, left agriculture with a much lower proportion of development investment. "Agriculture, hailed as the focus of the country's development efforts, has been ignored" (Kahama *et al,* 1986).

In addition, to the deterioration in the terms of trade, two major set-backs came with the break-up of the East African Community and the subsequent closure of the border with Kenya in 1977, and the war with Uganda, which began at the end of 1978. These latter were estimated to have cost the Tanzanian government an estimated US$ 200 million and US$ 500 million respectively (Lipumba, 1988). It was also argued that the abolition in 1975 of the Ministry of Economic Affairs and Development Planning, which previously had co-ordinated all the other ministries and agencies in the economic and development planning of the nation, led to a period of uncoordinated and weak national planning. (Katona, 1988)

Due to internal pressure and external advice, import restrictions were relaxed towards the end of the 1970s (imports grew 54 per cent in 1977-78). Oil prices increased again as Tanzania

approached the 1980s, and 1980 itself brought drought. At the turn of the decade official foreign development assistance had risen to the equivalent of over half the total annual level of imports, from only 15 per cent in the first three years of the 1970s. The Economic Recovery Programme in 1986 reinforced the trend of external dependence by stating that external assistance "will have to be increased over the medium term if the recovery programme is to lead to renewed growth in the country" (Quoted in Katona, 1988, p.142). It may be argued that Tanzanian planning and development has adopted an almost instinctive reliance on external donors; indeed, the fiscal aspects of the development budget have what is called a "foreign component" built in to them, implying a strong degree of foreign assistance.

2.4 1980 to the present

The 1980s began with an increasing deficit and worsening food production crisis. On 7th July 1981 the Financial Times carried a report that Tanzania had the equivalent of two days' worth of government reserves left (Financial Times 7/7/81) and reports of impending doom came from other quarters. In 1979 Tanzania engaged in negotiations with the International Monetary Fund (IMF) which became heated and continued for long periods of time with both sides at loggerheads. In particular the Tanzanian side opposed devaluation of the Tanzanian Shilling. In his New Year address in 1980, President Nyerere publicly denounced the IMF for attempting to take advantage of Tanzania's weak economic position to interfere in its domestic economic policies (Lipumba, 1988). This public denunciation made negotiations politically very difficult. Any acceptance of the IMF's conditions would appear as a submission to IMF pressure. This coincided with a period of relaxation of the IMF's conditions to all borrowers. Many commercial banks had begun offering credit to developing countries without the conditionality required by the IMF. Tanzania's other aid partners stepped back to wait for the outcome of the IMF negotiations. Despite the difficulties, the negotiations continued and in 1980 an agreement was reached, with Tanzania gaining concessions from the IMF. No policy adjustments were specified before the release of the credit, as in other IMF-sponsored agreements, only broad policy objectives. However, the credit ceilings for the first nine months were exceeded and the agreement frozen within the first quarter.

In 1981 Tanzania published the first of its emergency economic policy programmes, the National Economic Survival Programme (NESP), abandoning the established five year plan system. The aim of this programme was to boost exports and increase industrial efficiency. However, this proved to comprise a series of economic targets based on unrealistic and over-ambitious economic projections, few of which were reached. The NESP was written by the newly reinstated, but weaker Ministry of Economic Affairs and Development Planning. The new ministry did not have the widespread operational support it had previously enjoyed in the sectoral ministries (Lipumba, 1988).

In 1982 the Tanzania Advisory Group, set up by the Tanzanian government and the World Bank and consisting of three independent experts (the so-called 'Three Wise Men'), produced an analysis of Tanzania's economic problems and a set of proposals. This became the Structural Adjustment Programme (SAP), a "short-term emergency programme to combat the existing crisis." (Kahama *et al* 1986). The SAP, which was closer to IMF thinking, proposed tighter control on foreign exchange allocation, measures to improve the efficiency of parastatals, many of which had run up enormous debts, and efforts to promote industry and exports. Tanzania introduced a 10 per cent devaluation, from TShs 8.32 per dollar in December 1981 to TShs 9.41 in March 1982. This was followed by further devaluations of up to 40 per cent at a time to TShs 17.17 in June 1984 (Marketing Development Bureau, 1987). However, the SAP assumed that the main constraint to the nation's economic recovery was a shortage of foreign exchange. The government clearly expected the IMF negotiations to be more fruitful, perhaps as a result of this programme. The foreign exchange shortage was expected to be made up by additional foreign exchange inflow. In spite of the series of currency devaluations and other voluntary measures of economic discipline on the part of Tanzania, no agreement with the IMF and the World Bank was immediately forthcoming.

Export earnings continued to decline initially in the early 1980s, from US$ 554 million in 1981 to reach a low of US$ 286 million in 1985. In spite of the decline in import expenditure from a peak of US$ 1,219 million in 1980 to US$ 815 million in 1983, this could not be maintained, and the import bill increased again to US$ 999 million by the end of the SAP and further to an estimated US$ 1,150 million in 1987, resulting in an estimated trade deficit of US$ 770 million (Marketing Development Bureau, 1987). Inflation, based on the National Consumer Price Index, was erratic over the period of the SAP (Table 2.3). The large increase in inflation between 1983 and 1984 is considered to be the direct result of the reduction in control over prices of such things as agricultural inputs, and decontrolling maize flour and consumer goods' prices (Lipumba, 1988).

Table 2.3 National Economic Indicators during the SAP years

	1981	1982	1983	1984	1985
Exports [1]	554	415	380	388	286
Imports	1,161	1,113	815	874	999
Balance	(607)	(698)	(437)	(486)	(713)
Inflation	22.7	32.6	19.2	44.0	28.2

[1] US$ million

Source: Marketing Development Bureau, 1987

In the latter period of the SAP, the government introduced policies liberalising imports, by waiving restrictions which had been placed on merchants and the import of certain consumer goods. For example, restrictions on private traders' ability to bank export revenue abroad were relaxed, and private trading between producers and consumers was encouraged by lifting the previous limit of 30 kg on food grain sales to 500 kg. SAP did not achieve the targets it set

out, mainly because of the lack of expected foreign exchange inflows, in the form of foreign aid and credit. The SAP did begin to address some of the long term problems such as parastatal inefficiencies and low export revenues, to a limited extent. These moderate achievements were at the expense of inflation. The gap between urban wage increases and soaring inflation widened.

However, agreement with the IMF had to wait until November 1985 after the state Presidency had passed from Julius Nyerere to Ali Hassan Mwinyi in what has been described as one of the most peaceful transitions of power in post-colonial Africa. Final agreement was reached after the publication of the details of the Economic Recovery Programme (ERP) in May 1986. The continued problems of the Tanzanian economy, indeed its almost total collapse, encouraged intense debate on the types of policies which could be adopted to recover the situation (Lipumba, Msambichaka and Wangwe, 1984). The discussions intensified in early 1986, as the foreign exchange situation worsened, fuel shortages became acute and the government was criticised for over-valuing the Shilling. The final outcome of these discussions was the ERP, a programme of more liberal policies, developed in close consultation with the World Bank, moving the government's development strategy more in line with IMF prescriptions. The intention of the ERP was to increase the output of export and food crops, rehabilitate the infrastructure, raise industrial capacity utilisation and redress the balance of payments (O'Neill, 1990). In addition, the government, under pressure from the IMF and its major donors, devalued the Shilling from TShs 15.49 in March 1986 to TShs 40.34 to the US dollar by June 1986 (Marketing Development Bureau, 1987). The Bank of Tanzania expressed its expectation that it would have to adjust periodically the exchange rate during the period of the ERP in order to account for the effects of inflation. This, along with the low producer prices and the liberalisation of the market system, was the key to achieving agreement with the IMF. The ERP prompted agreement with the IMF the same year it was adopted. The following year the World Bank agreed to lend US$ 50 million to assist in financing the first year of the ERP and the donors Consultative Group pledged additional support of US$ 1,930 million in total financing for the period of 1987/88 (O'Neill, 1990). The measures contained in the ERP were intended to increase agricultural production through increased producer prices, improved access to inputs and increased supply of consumer goods, through restored industrial output. However, the risk involved in the ERP was the high inflation which followed as a result of the devaluation of the Shilling. As the Shilling was devalued, the cost of imports, such as chemicals used in the production of agricultural inputs, rose. These costs were passed on to consumers through the increased prices paid for food, in addition to the general inflation. The Marketing Development Bureau estimated that the foreign exchange component required for imported inputs for maize production was US$ 68 per US$ 100 output, largely accounted for by the cost of transport. This is compared to a foreign exchange cost for the export crops ranging from US$ 8 for hard coffee up to the maximum of US$ 67 for sisal and tobacco (reported in Marketing Development Bureau, 1987). As foreign exchange became more expensive, this component became increasingly significant. The liberalisation of the food grain markets and removal of the

sembe subsidy has resulted in the consumer bearing the entire burden of the cost of production. The removal of subsidy and increasing cost of *sembe* purchases is contrasted by Bryceson (1990) with the declining value of minimum urban real wages. Her estimates, based on Ministry of Agriculture data show that urban real wages have decreased to 29 per cent of its 1973 value, or 24 per cent when valued as the amount of *sembe* a day's wages could purchase (Bryceson, 1990).

Exports rose by 8 per cent in 1986, the first year of the ERP, (Bulletin of Tanzanian Affairs, 1989), although 1986 was a year of favourable rainfall (Ellis, 1988). Imports reached US$ 1,092 million in 1987 and exports, US$ 347 million. The GDP increased by 3.8 per cent in 1986, and with a population growth rate of 3.3 per, this cent meant a real per capita GDP growth for the first time in the 1980s (Marketing Development Bureau, 1987). By 1987 economic growth was 3.9 per cent, and in 1988 the growth rate reached 4.1 per cent, but still falling short of the ERP's expectation of 4.5 per cent. Export income grew over the ERP period and the contribution of 'non- traditional' exports has shown particular promise. Export revenues are estimated to have been nearer to the expected US$ 686 million than the official figure of US$ 362 million, because of the substantial quantity of exports going unrecorded. Employment rose, except in mineral production. Inflation, which was planned to be reduced to 20 per cent by 1988, remained stubbornly at 28.2 per cent (Bulletin of Tanzanian Affairs, 1989). However, there is a possibility that this estimate of economic growth underestimates the true position, as a result of the emergence of small scale and informal activities, which are not adequately represented in the published statistics. On balance, the ERP has been considered as a successful programme, although problems remain. In November 1988, the value of the Tanzanian shilling was reduced from TShs 98 per dollar to TShs 120. This appears still to over-value the shilling in relation to the informal market rate, although the informal rate also reflects an additional premium because of the demand for dollars which are restricted in the formal market. In addition, these informal markets are illegal and therefore conducted in cash and in secret, and are therefore impossible to estimate.

Since the development of the Economic Recovery Programme, initiated in 1982, the government appears to be turning a "blind eye" to much of the parallel food crop marketing, since, especially in urban areas, food would otherwise be almost prohibitively expensive. (Gordon, 1988) Bryceson argues that the fact that the Ministry of Agriculture had begun collecting parallel maize market price data was an indication of the importance of this sector of the economy. The parallel market for maize and other staple grains was effectively legalised with the removal of the *sembe* subsidy in the 1984 budget, the removal of road-blocks set up to check black marketing of grain and raising the restrictions on grain transporting by private individuals up to 500 kgs. These moves were reinforced, when in 1987 all restrictions on the transport and movement of food grains by private traders were removed. The traders were still not allowed to purchase from peasants or cooperative unions, but the National Milling Corporation's activities were limited in order to reduce its deficits and unions with deficits were

not permitted any further credit finance for crop purchases, further restricting the official market's sources of supply and ability to distribute. By 1984-85, the Marketing Development Bureau estimated that 70 to 75 per cent of all marketed maize grain went through parallel market channels, although, Bryceson argues that, in view of the severe transport constraints throughout the country at this time, this figure seems exceptionally high (Bryceson, 1990).

According to Bryceson (1990), one of the successful outcomes of government policy aimed at redressing the regional imbalance, was that of the pan-territorial crop prices paid by the National Milling Corporation to producers during the 1970s and early 1980s. It encouraged tremendous growth in food production in the southern, previously neglected regions of Ruvuma, Rukwa and Mbeya. This achievement, however, "was overshadowed by the problems arising from the enormous transport costs required to sustain it." (Bryceson, 1990) Indeed, it was the immense burden of transport costs which brought about the recent limitation of the NMC's activities. This had the result of promoting food crop production in ecologically suited areas, which previously, due to the economics of transportation, had not produced food commercially in such large quantities. Ruvuma, Rukwa, Iringa and Mbeya, known as the 'Big Four' became major production regions for maize, accounting for 17 per cent of national maize purchase. By 1981/82 this figure had increased to 87 per cent, whereas previously most of the marketed grain came from the north and central parts of the country (Bryceson, 1990). "In 1981 the government began to move away from its previous commitment to pan-territorial prices and introduced regional price differences for some domestic crops. The basis for these price differences was comparative advantage in production ..." (Ellis, 1988, p.72) From 1982 to 1988 the price policy invoked the principle of comparative advantage, giving a premium price to climatically suited areas. The expectation was that this more narrow concentration would lower the cost of transport as the NMC's purchases focused on the so-called 'Big Four', rather than a more diffused national purchasing regime. The outcome was in fact to increase the costs of transport still further as almost all the NMC's purchases were focused in the southwest of the country and a large part of its sales were focused on Dar es Salaam in the east of the country. The result was to force the government to arrest the continued rise in costs by limiting the NMC to take transport costs into account in its purchase prices, and operate on a strictly commercial basis. The most recent change in policy has resulted in disillusionment among producers from the 'Big Four'. The government's original policy had been to encourage producers in these areas to go into production by the government's flat price policy allowing them to take advantage of their environment suitability to maize production. Now, as a result of recent, more pragmatic government policy, their grain production is no longer profitable.

Additional changes in state involvement in the agricultural sector have reduced the burden of costs on government budgets and at the same time allowed private sector rehabilitation. The government has been reducing its role in direct production and marketing of agricultural commodities. For example, National Agricultural Food Corporation land has been leased to the private sector in Arusha for food production, while some coffee estates in Kilimanjaro and

Arusha have been transferred to the private sector (Bulletin of Tanzanian Affairs, 1988). Some sisal estates have attracted foreign investment and recruited personnel to manage sisal production, while some have been sold. This process appears to have encouraged investment in new equipment and the rehabilitation of the land. In addition, the National Milling Corporation's legal monopoly in purchases of wholesale food grains was withdrawn, and the NMC instructed to operate on a strictly commercial basis. This has resulted in a shrinking of the activities of the NMC mainly to purchases for the urban market, to the management of the strategic grain reserves, and to external trade in grain. By 1988 open market channels in Tanzania were estimated to account for 65 per cent of total marketed quantities of maize and 94 per cent of rice, but the importance of the open markets is likely to increase (Gordon, 1988). Indeed, in Bryceson's (1990, p.13) survey of urban household consumption in Arusha, Mwanza, Dar es Salaam, Mbeya and Songea, "informants reported that virtually all purchases of maize were made in the open market, even in Dar es Salaam", where 70 per cent of the NMC's sales take place. Thus by the time the *sembe* subsidy was removed, it seems likely that the people most likely to benefit from it had already been forced in to the parallel market in search of food, because of the shortages in the formal market. Bryceson (1990) argues that this already present reliance on the parallel market and its higher prices, is the reason there was little public unrest as a result of the austerity measure taken by the Tanzanian government in the early and mid 1980s.

The budget of June 1989 announced a further devaluation in the Shilling from TShs 137 per dollar to TShs 145, and also that the minimum monthly wage was to be increased from TShs 1,645 to 2,075. The government was still under pressure to repay its foreign debts. In 1970 Tanzania's external debt accounted for an equivalent of 5.3 per cent of its export earnings, but by 1987 this had risen to 18.5 per cent. Discussions were under way with the IMF and World Bank to extend repayment periods and some bilateral donors had converted some previous loans into gifts, releasing Tanzania's obligation to repay, and hence reducing its debt burden.

In a continuing effort to encourage all forms of export production, the government announced in 1990 that producers were now free to export some non-traditional export crops directly. This meant that crops other than cotton, coffee, tea, tobacco, sisal, cashewnuts and pyrethrum could be exported without having to use a marketing board. These crops include some vegetable, fruit, flowers and spices. (Bulletin of Tanzanian Affairs, 1990). New regulations were laid down to encourage foreign and domestic investors, offering tax incentives, particularly for investment in strategically important sectors for the Tanzanian economy. This has arisen from a recognition of the importance of attracting foreign investment into the economy. Limits on investment will still be enforced, but the process will be streamlined through the establishment of the Investment Promotion Centre to take ultimate responsibility for coordinating the assessment and regulation of foreign investments.

The 1980s have been characterised by 'crisis management': that is, measures such as currency devaluation, to improve producer prices; increased wages to alleviate the pressures of devaluation on those not producing for export; the abolition of the *sembe* (maize flour and main staple food) subsidy; and the return of marketing co-operatives, as the larger parastatals were seen as large and inflexible. The economic future of Tanzania will depend on the ability of parastatals, which still dominate the economy, to become more flexible and efficient and to control their costs. This is considered the key to the control of credit and monetary expansion, which in turn influences the inflation rate (Lipumba, 1988). However, the answer is not the abolition of public enterprises, because, costly or not, they fulfil important roles in the economy and there is no alternative to them at present. At the current time the economy is caught between the necessity to maintain its public sector and to reduce its credit and inflation, in order to continue to meet IMF and World Bank criteria.

The SAP was based on the assumption of continued and increased foreign income, which did not materialise. More recent budgetary modifications have not rested on this assumption and appear to have had some measure of improvement (Raikes, 1986). This type of more recent 'stabilisation policy' has been seen as a necessary facing up to the reality, and, it is argued, not a turning away from the socialist path for good. The country seems set for some measure of relaxation of the price marketing and import controls in an attempt to restructure the economy towards "greater allocative efficiency" (Amani, 1984).

2.5 Summary

In 1967 Tanzania chose a radically alternative path of development concentrating on policies developed to provide for the needs of the majority. Clearly this has to some extent been successful. Tanzania has one of the highest literacy rates in Africa, it is widely regarded as having one of the lowest disparities in standard of living and, despite the chronic economic crisis, has remained one of the continent's most politically stable countries. However, Tanzania's economic crises have been exacerbated (some would say caused) by high government expenditure and high recurrent budget costs. The government stretched itself to become sole banker, sole trader of food and export crops, sole transport provider, and the main manufacturer and provider of industrial and agricultural inputs. Production and government income have not been able to keep pace with government spending, even with increased foreign assistance, to the extent that Tanzania is one of the largest recipients of foreign aid in sub-Saharan Africa. Tanzania has had, most recently, to approach its economic situation in a more pragmatic manner. It has had to withdraw from many of its command roles in the economy, such as agricultural production, by selling, leasing or reducing central control over export crop estates. It has reduced the role of the National Milling Corporation, formerly the sole buyer of maize, to manager of the strategic grain reserves and external trading agent. Despite these large reductions in direct state involvement, many open market operators had already preceded them by informally taking part of some parts of the economy. For example,

before the National Milling Corporation's domestic monopoly was revoked, there was already a substantial informal market for staple grains. Indeed, there still is an informal market for the exporting of staple foods. The informal sector is acknowledged privately by the government to play an important role in the survival strategies of the majority of urban households (Bryceson, 1990).

Initial attempts at economic improvement foundered under ERP and SAP, both of which assumed increasing foreign income. This foreign income was not forthcoming and foreign aid was slowed by the negotiations and re-negotiations with the IMF, which were fraught with difficulties. Budgetary adjustments, such as devaluation, revoking of the parastatal monopoly of certain markets and the re-introduction of crop marketing co-operatives have given more flexibility to the economy and allowed an active parallel free market to be legitimised, continue and expand.

It is within the economic and political context that has been identified above that the Tanzanian production of fruit and vegetables has developed. Fruit and vegetable production has never been under the direct control of any parastatal marketing body. The only state mechanism with any form of fiscal control over the domestic fruit and vegetable market is the Kariakoo Market Corporation (KMC), which controls the Kariakoo wholesale market, through which all fruit and vegetables entering Dar es Salaam are required by law to pass. This wholesale market is managed by the KMC, although the dealers in the market are all private traders. The KMC provides the market with premises in return for a licence fee paid by the dealers and a commission levy paid by those delivering their produce.

In addition to this, the city authorities have had an indirect effect on the fruit and vegetable retailers. In the early 1980s the government went through a period of blaming its immense economic woes on factors beyond its control. One of the factors which it highlighted were informal sector traders, these people being portrayed as unemployed parasites, living off legitimate urban dwellers. This reached a peak in 1983 with the Human Resources Redeployment Act, which allowed the police to arrest any male they suspected of not having legitimate formal employment. If the police suspicions were proven, then these individuals were expelled from the city and returned to their village of origin. The effect of this on the informal sector was to create an atmosphere of intense suspicion. Many traders, who had no other form of income laid their produce out on a small piece of cloth, which could be quickly gathered up and carried easily if the police appeared. The mid to late 1980s saw a moderation in the government's attitude towards these people as many prominent economists pointed out that rather than being parasites these people were providing crucial services to many of the formally employed urban residents. Indeed, the informal sector was providing employment for the urban poor, who had no other alternatives. This change in attitude has allowed much more stable street trading as the retailers have become increasingly confident. However the

uncertainty remains, as will be explained later, and many of the fruit and vegetable retailers remain suspicious of the government's motives.

The overall effect of the economy on the ability of the government to provide the agricultural sector with the required infrastructure and inputs is significant. The adverse effect of the economic crisis on those on low incomes in the urban areas has adverse effects on the producers in the rural areas. Unlike in the case of staple foods, where demand is inelastic, demand for fruit and vegetables tends to vary much more. If a household earns less one month, they still require the same amount of maize. They may, however, do without their vegetable dishes or their fruit snacks. The more fluctuating demand varies through the year.

The period from the adoption of the Arusha Declaration to the end of the 1970s may be characterised as a period of socialist transformation and planning, and policy centralisation. This resulted in the government taking centralised control of the main food crop marketing and production support. However, the combined effects of poor accounting systems and the lax controls resulted in mismanagement and individuals taking the opportunity of their position for self-aggrandisement. The immense economic burden which the crop marketing system became towards the end of the 1970s began to force the government and many prominent Tanzanian economists to question seriously some of the policies made early in the post-Arusha euphoria. This became particularly important as it became clear that agricultural production, on which the economy depended for a large proportion of it foreign exchange, was not going to recover easily from the mid 1970s agricultural crisis. The broader economic difficulties brought about by external factors such as the war with Amin's Uganda, the break up of the East African Community and increases in fuel costs had additional effects on agricultural marketing, most significantly through the increased cost of transportation. The poor condition of the formal sector encouraged the development of a black market in many staple food crops, and, although this met with outrage at first, gradually an awareness grew of the importance of this sector in maintaining the supplies of basic foods to consumers, for whom the state sector could do little. The informal sector was legitimised through various policies from 1984 including the revoking of the National Milling Corporation's monopoly and the removing of the restrictions on private traders' movements of grain shipments.

Against this background the production and marketing of fruit and vegetables have remained largely uncontrolled, and relatively unsupported. There were a number of small initiatives involving cooperative societies in the purchase and marketing of fruit and vegetables during the mid 1970s, for example the Primary Cooperatives supported by the Lushoto Integrated Development Programme and the Tchenzema Vegetable Farmers' Cooperative Society, both of which had retail outlets in Dar es Salaam. However, these appeared to be unable to withstand the competition with private traders who operated legitimately in competition with them. The only restriction to fruit and vegetable traders bringing produce to Dar es Salaam, was the legal requirement to deposit their delivery at the Kariakoo market, where they were

subject to a sales commission on their deliveries. However, within the market, the dealers were operating in open market conditions, with prices varying according to supply and demand.

In parallel with the economic restriction on the official grain marketing institutions, the Kariakoo market appears to have been unable to cope with the increases in volume of fruit and vegetables demanded by the increasing Dar es Salaam population. As the private grain market traders sought alternative outlets for their grain, so the fruit and vegetable traders sought to avoid the congestion and the commission charges of Kariakoo by selling to parallel wholesale dealers in the retail markets elsewhere in the city.

There is already a considerable body of literature which has been generated concerning the role of crop authorities and marketing boards in the marketing and distribution of the main staple grains during Tanzania's socialist transformation era (Bryceson, 1985; Ellis, 1982, 1983, 1984; Lofchie, 1978; Shao, 1986). A growing body of literature exists on the informal sector and open market for grain trading as Tanzania entered its period of economic recovery (Ellis, 1988, Bryceson, 1990, Gordon, 1988, Maliyamkono and Bagachwa, 1990). However, very little is known of the conditions under which fruit and vegetables have been produced and marketed under the socialist transformation (Mascarenhas and Mbilinyi, 1971; Mbilinyi and Mascarenhas, 1973; Sporrek, 1985), and even less is known about the their supply during the period of economic recovery (Mascarenhas, 1984). The lack of control or monitoring of the fruit and vegetable sector before the 1980s has resulted in sparse evidence with which to build a profile of this period. This study sets out to address the lack of information concerning the recent period of fruit and vegetable production and marketing, within the context of the liberalising of Tanzania's socialist economy. As has been discussed already, it will examine the entire system of supply, from the production through to the retail sector.

Chapter Three

Survey Areas and Survey Methods

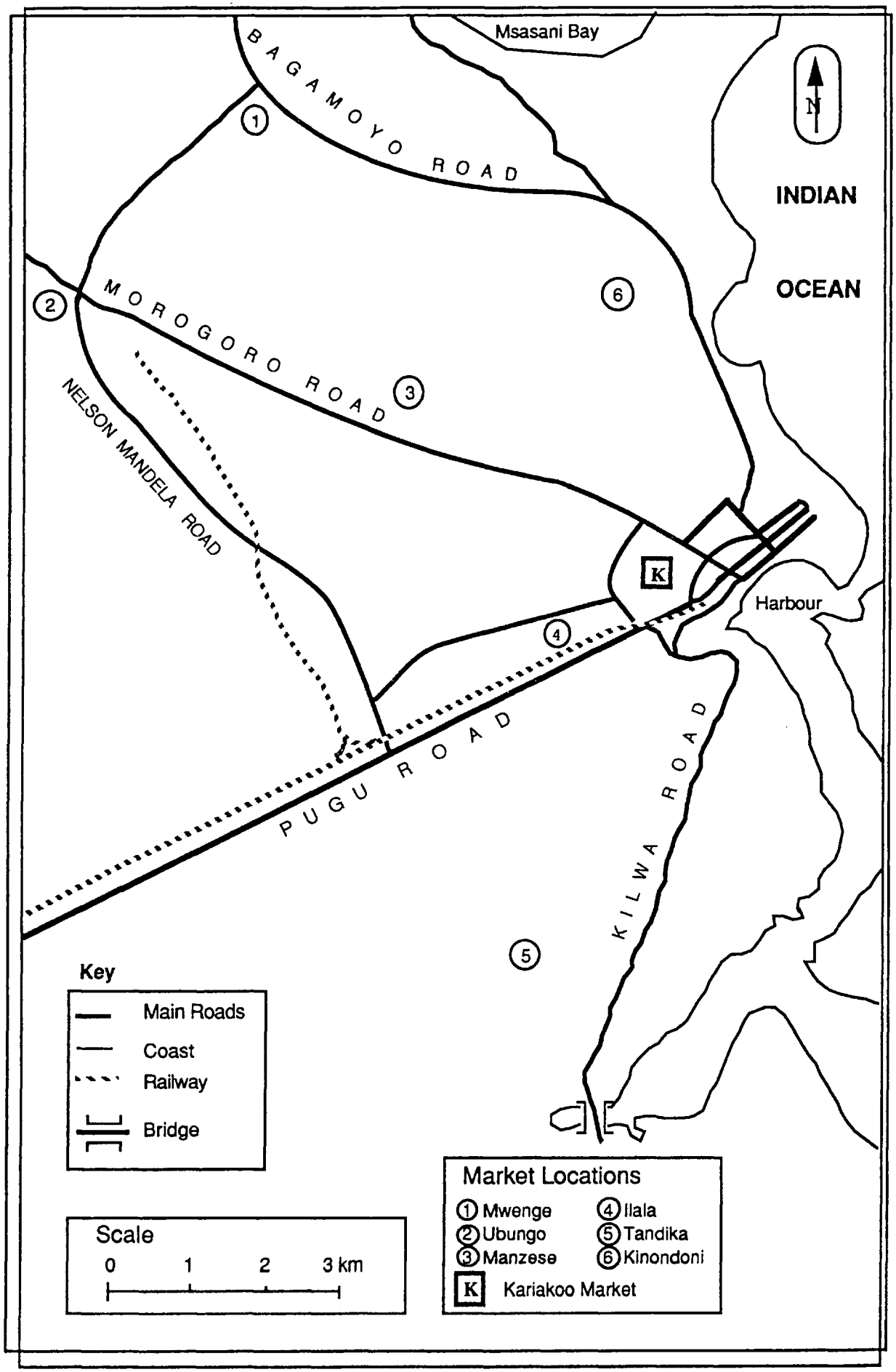
3.1 Data Sources

This chapter describes the areas in which the research for this study was carried out, focusing on their socio-economic background, providing a geographical context, and explaining their role in the national economy and how this has developed over time. The research methods are also presented as they were applied in each of the areas. In order to meet the research objectives, this study involved fieldwork in two rural production areas and several market locations within Dar es Salaam. The fieldwork was intended to examine the entire chain of fruit and vegetable supply, from the production to the retailer. In order to assess the different elements in the supply process a variety of techniques were adopted, including questionnaire surveys, the collection of secondary data, and field observation. Finally, several in-depth interviews carried out with participants at all levels of the supply system, as well as outside observers, in order to provide additional qualitative data to contribute to an interpretation of the quantitative data and to provide a background to the analysis.

3.1.1 Primary Sources of Data

Data used in this study include both primary and secondary sources. The primary data were collected by both extensive questionnaire surveys and semi-structured interviews. According to Hill (1963) markets have been surprisingly unimportant in East African towns, such as Dar es Salaam, until relatively recently. Currently, however, Dar es Salaam has a wide range of retail market outlets where fruit and vegetables can be purchased. These range from individual fruit sellers who have set up their own stall on a street corner, to the large modern Kariakoo Market complex incorporating the city wholesale market, a food retail market and a shopping centre. This study focuses on the main city council run retail markets, where the retailers are grouped in numbers of about one hundred or more and provided with facilities, such as stalls, a roof, and an office. These market places tend to be the foci for purchases for the population, and all are generally close to the main transport arteries of the city. They are therefore of considerable importance to the Dar es Salaam population as sources of food. The intention of this survey was twofold. Firstly, it was intended to investigate the level of direct transactions between rural producers and the urban retailers, which would be wholly informal sector trading. Secondly, it was intended to obtain data of the sources of produce from within the city. Dar es Salaam retailers have a range of channels from which to obtain food for retail. These include Kariakoo wholesale market, informal wholesalers at a retail market and urban, or peri-urban, production. The produce obtained from Kariakoo is entirely within the formal sector. However, the latter two channels are what may be described as informal sector sources, since legally fruit and vegetables which enter Dar es Salaam under commercial conditions should pass through Kariakoo's

Figure 3.1 The City of Dar es Salaam
(showing principal roads and the markets surveyed)



wholesale market. These data will provide a basis from which to estimate the relative importance of these channels.

A group of six markets were selected in order to produce a representative sample of the market retailers. As can be seen from Figure 3.1, there are four principal roads entering Dar es Salaam: Bagamoyo Road, to the north of the city; Morogoro Road, entering from the west; Pugu Road, in the south west; and Kilwa Road to the south. The survey set out firstly to ensure that the retail markets visited were relatively close to one of these main roads. Ubungo was chosen because it is located on Morogoro Road, Mwenge is on Bagamoyo Road, while Tandika is near to Kilwa Road and Ilala is near to Pugu Road. In addition, the markets reflect the broad range of roles in the urban food economy. Ilala, Tandale and Tandika are important sources of food for the poorer residential areas located nearby, while Mwenge and Ubungo are located near to the university where academic staff and middle ranking public employees often reside. Kinondoni reflects the top end of the market catering for the higher quality demands of those living in the Msasani and Oyster Bay areas, mainly high ranking civil servants, diplomats and much of the expatriate community. Ubungo, Mwenge and Tandale are known to be relatively recently established, while Tandika and Ilala are more mature markets. Finally Kinondoni, Mwenge, Ubungo and Ilala are known to be predominantly important retail markets, while Tandale and Tandika are also known to have important wholesaling functions.

The market survey was restricted to one week, due to the limited resources available. Each market was allocated one day for survey. On each day the author and a Tanzanian assistant visited the market place beginning with an interview of a market official. In most cases this official was the Market Secretary. The interview took place with the help of the assistant as interpreter, where necessary. This had the dual purpose of obtaining qualitative descriptive information about the market place and the fruit and vegetable distribution system, as well as gaining the confidence of the market official. It was found that when the market official accompanied the author and the assistant, the traders were more forthcoming.

The survey took place during the month of August, which is a relatively busy time for all the urban markets. The sampling strategy, therefore had to rely on the willingness of the retailers to answer questions. In order to reduce the refusal rate, to limit the interference in the retailers market activities and to maximise the sample size in the time available, the questionnaire was limited to eight basic questions (see Appendix 3.1). These concerned the length of time the trader had been in business, and the type and source of the produce sold, as well as the method of transporting the produce to market and to whom they sell. Lists of the retailers were not available, therefore, the sampling was based on the traders who were free to answer questions. The only condition for inclusion in the survey was that the retailer should sell fruit and/or vegetables. This narrowed down the population, as many retailers sell other commodities, such as herbs and spices, fish, meat, poultry, drinks, containers (such as bags, tins or buckets), and were therefore excluded from the survey. As a result, the survey is more

representative than may initially be concluded from the proportion of sampled retail traders from each market surveyed. This will be discussed in more detail in Chapter Five.

It should be noted that throughout the survey of retail markets, market officials and traders were reluctant to admit that retailers purchased their wholesale produce from anywhere other than Kariakoo. Although the legal monopoly is not currently enforced, those involved in informal sector trading are acutely aware that while Kariakoo's monopoly status remains on the statute books, they are extremely vulnerable, should it be enforced. Most traders remember only too well the strict enforcement of the short-lived Human Resources Deployment Act of 1983. This meant that all males not employed in formal sector employment were liable to be arrested and sent back to their village of origin. This effectively made any informal retailing an extremely risky business to be in. It has been estimated that of the city's 1.3 million population in 1983, approximately 166,000, or 12 per cent were formally employed. If it is assumed that each of these has an average of four dependents, then this only accounted for 830,000, or 64 per cent of the city's population. The remaining 36 per cent depended on the formal sector (Bulletin of Tanzanian Affairs, 1984).

Table 3.1 The main Open Market Supply Regions for Dar es Salaam and Coast Regions 1984/85

Region	Distance *(km)*	Commodities *staples*	*fruit and vegetables*
Morogoro	200	rice, cassava	bananas, Irish potatoes, onions, cabbage, tomato, pineapples
Tanga	350	maize, rice	beans, Irish potatoes, cabbage, tomatoes, oranges, apples and pears
Iringa	500	maize, wheat, millet	beans, cowpeas, Irish potatoes, onions, cabbage, tomatoes
Moshi	570	maize, bananas	beans, cowpeas, Irish potatoes, tomatoes
Arusha	650	maize, wheat	bananas, cowpeas, onions, cabbage, peas
Mbeya	900	maize, rice	bananas, beans, Irish potatoes, cabbage tomato, peas, carrots

Source: Marketing Development Bureau, 1986

Two case study areas, known to be important fruit and vegetable supplying areas for Dar es Salaam, were selected for a producers' questionnaire survey (Appendix 3.2). The Marketing Development Bureau, a department of the Tanzania's Ministry of Agriculture, identifies six regions as being important for supplying Dar es Salaam with food, although their relative importance is not indicated (Marketing Development Bureau, 1986). These are Arusha Region, almost 650 kilometres by road north of Dar es Salaam; Moshi Region, to the east of Arusha, and about 570 kilometres by road from Dar es Salaam; Morogoro, which is 200 kilometres from Dar es Salaam; Tanga, 350 kilometres from Dar es Salaam; Iringa, which is just over 500 kilometres from Dar es Salaam in the southern highlands; and Mbeya, located just under 900 kilometres by road from Dar es Salaam. The crops supplied by these regions to Dar es

Salaam are presented in Table 3.1. It should be noted that this survey was carried out at the peak of the Tanzanian economic crisis in the early 1980s; it can, therefore, be expected that, as a result of an easing of economic difficulties and the liberalisation of inter-regional trading regulations, the trading of a wider range of commodities on the open market from these regions will have increased. In addition, a number of areas around the city of Dar es Salaam, are also increasingly important as sources of supply for the city, although they were not picked up in the study of inter-regional trade.

Further interviews were carried out, including informal discussions with Dar es Salaam residents, to narrow down the list of sources to two locations in order to provide a manageable survey. The intention of the field-based part of the research was to carry out both a major questionnaire survey of producers of fruit and vegetables, and to carry out longer interviews with a small number of producers, market officials, local government officers, traders and agricultural extension workers. The choice of the two survey areas was based in part on the evidence of the secondary data, and partly on the evidence collected from in-depth interviews carried out in Dar es Salaam. The data collected from Kariakoo Wholesale Market and the Marketing Development Bureau suggested that Morogoro Rural District's advantageous location, relatively close to Dar es Salaam, with the environment to produce both tropical fruits and temperate vegetables makes it an extremely important source of food for the main city. It is in fact the closest area with an environment capable of producing temperate vegetables, and at only 200 km distance, along good roads, is about a three hour lorry drive from Dar es Salaam.

In contrast, Lushoto District in Tanga Region is a 350 km drive from Dar es Salaam, along relatively poor roads, or the equivalent overnight lorry drive. However, its higher altitude village environments are even closer to the temperate conditions required to grow such vegetables as cabbage, Irish potatoes, apples and tomatoes. These two areas are considered of enormous importance to the supply of fruit and vegetables to the urban market of Dar es Salaam.

Complications arose with the author's permission to visit certain parts of Morogoro Rural District, as the District has a number of sensitive establishments, including a refugee centre and training college for the African National Congress of South Africa, a military airfield and a munitions factory. As a result, although the research assistant was able to carry out one questionnaire survey in Matombo village and one in Mgeta Division, the author was only able to visit and carry out interviews in Mgeta. It is difficult, therefore, to balance the results in each of the districts, since there were greater restrictions on the study activities in Morogoro, where only two village surveys were possible. By contrast, there were minimal restrictions on research activities in Lushoto, and so four villages were surveyed there. The breakdown of response rates is presented in Table 3.2.

Table 3.2 Breakdown of the Respondents to Producers' Survey by Village

Village (*District*)	Frequency	Per Cent
Matombo	42	15.5
Mgeta	43	15.9
Morogoro	*85*	*31.4*
Lukozi	48	17.7
Lwandai	49	18.1
Soni	47	17.3
Malindi	42	15.5
Lushoto	*186*	*68.6*
Survey Total	271	100.0

Source: Author's Survey

The study focused on the producers of fruit and vegetables for selling to the urban markets. The ability to carry out any form of random or stratified sample was severely restricted by the lack of any lists of fruit and vegetable producers. As a result, such producers were chosen, with the help of village government officials and agricultural extension officers. The results of this questionnaire survey cannot, therefore, claim to be representative of the agricultural producers of the areas visited. This questionnaire survey set out to obtain a representative view of those agricultural producers who are involved in fruit and vegetable production, and who sell their produce to traders. This sampling 'strategy' is not bias-protected, in the sense that it prevents unconscious bias on the part of the surveyor, but it has sampled a higher proportion of the population of fruit and vegetable producers than a similar-sized sample of general agricultural producers, because, although the number of fruit and vegetable producers is not known, it *is* known that the population of these producers is smaller than that of general agricultural producers. In view of the time and resources available to the author, and the importance of such quantitative data, this was considered to be the only option for obtaining meaningful primary data.

Finally, Hollier (1990) argues that it is important to distinguish between the different types of market participants. He identifies four basic categories: local consumers; producers-sellers; bulk-buying commodity traders; and traders of manufactured items. The commodity traders are of enormous importance in the fruit and vegetable marketing system, therefore, a detailed questionnaire survey was carried out of traders purchasing crops in Lushoto District (Appendix 3.3). The survey of traders in Lushoto District comprised a detailed questionnaire sample of thirty traders active in commodity purchasing at three of the most important periodic markets in villages in Lushoto District, namely Soni, Mlalo and Lukozi (see Figure 6.1). These markets were selected because they are all located on the main road running through Lushoto District and are, therefore, foci of commercial activity in the District's wholesale system. The three markets are located within three of the four agro-ecological zones defined by the Soil Erosion Control and Agro-Forestry Project (SECAP), discussed in Chapter Three. Obtaining permission to carry out a similar survey in Lushoto town proved difficult, although no direct

reason was given for why this was the case. In Lushoto, however, the author was able to interview a number of key informants, who gave some qualitative insights into the fruit and vegetable trade in the area. These individuals included the local Kilimo horticultural extension officer, the Lushoto Market revenue collector and secretary, two party officials, a small number of local farmers and business people and the local secondary school geography teacher.

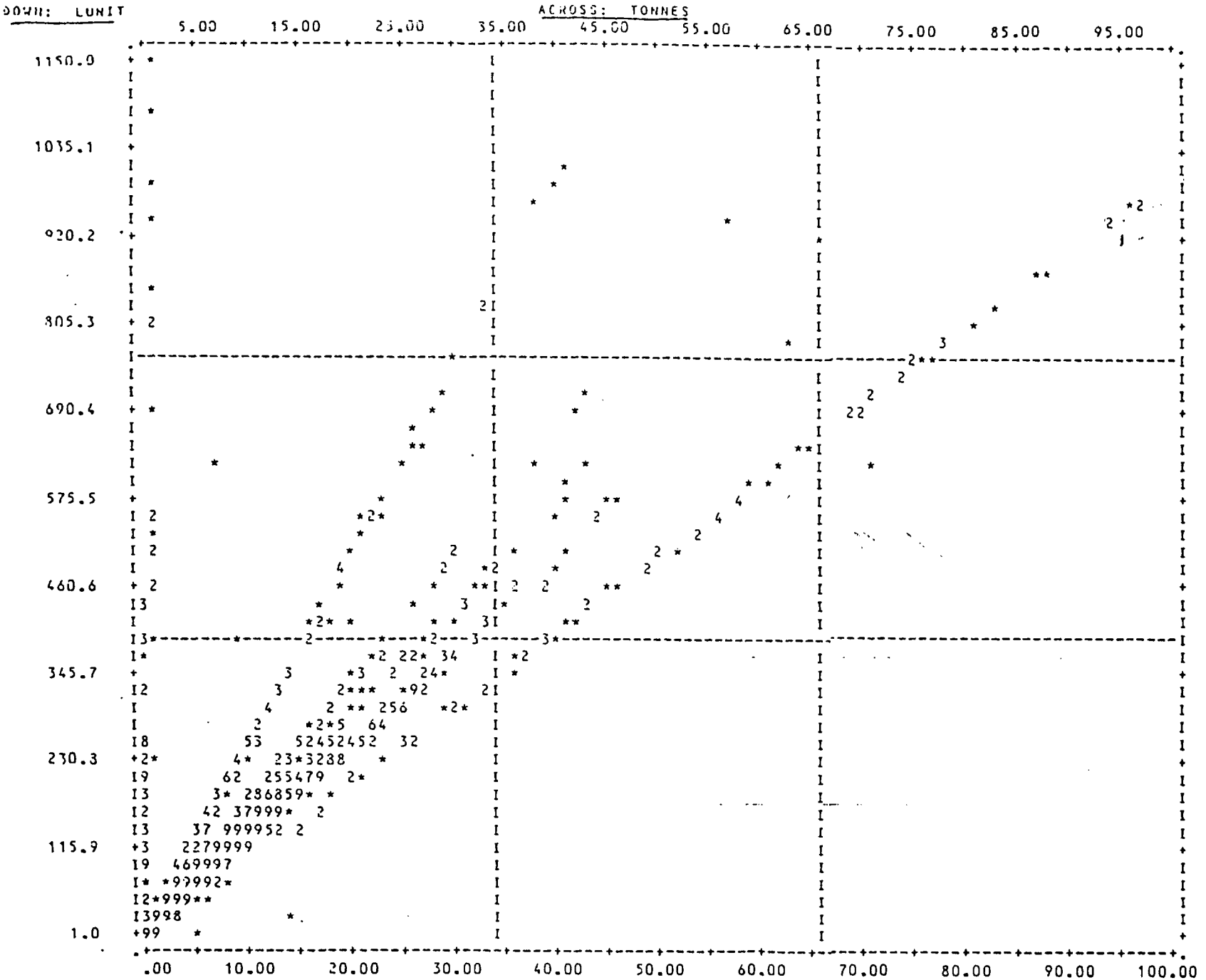
3.1.2 Qualitative Data Collection

In addition to the questionnaire interviews, the author conducted in-depth interviews with key informants in the producing areas and in the city. These were participants in the production, purchasing, transportation, distribution, trading and regulation, of the fruit and vegetables production and marketing system. They also included village government officials, teachers, a prison governor, market officials, expatriate extension workers in the areas concerned and the general manager of Kariakoo Market Corporation. These informants also occasionally provided valuable secondary data, in the form of reports, published and unpublished datasets and production estimates, which have been included, where relevant, in the analysis. The interviews took an informal approach, although a set of eight key questions had been identified before beginning the fieldwork, concerning the informant's role or outlook on the production and supply system. These eight questions form an interview schedule around which the interviews were loosely structured. A copy of this schedule is in Appendix 3.4 and a list of interviewees in Appendix 3.5. Observations made during the course of the field visits were also recorded by the author and the research assistants. These have been used to confirm reports from informants and as evidence in the study

3.1.3 Secondary Sources of Data

A problem encountered in the analysis of the data obtained was the difficulty in converting local units of measurement to the more standard measure of kilograms. Table 3.3 is an attempt to achieve a conversion table from the local units to the metric equivalent. The high degree of variability comes principally from varying types and sizes of commodity and container, but differences also come from the degree of efficient packing of the goods and the different varieties, size, and the degree of estimated wastage as a result of transportation. For example, a market official at Mwenge market in Dar es Salaam estimated that out of one hundred oranges arriving at his market, via Kariakoo or Tandale, up to twenty-five may be spoilt.

Figure 3.2 is a scattergram of the local units plotted against the metric tonnes for the entire period of the sample of daily records and for all the commodity types. The various 'fingers' of plots extending from the origin at different gradients represent different conversion factors. It can be seen from this that there are four main 'fingers', and within these the conversion factors tend to be relatively consistent. In fact, the lowest correlation coefficient of local units against metric tonnes is for limes with 0.90 ($p>=0.001$). The next lowest is tomatoes from Lushoto and Mbeya, followed by tomatoes from Iringa, with correlation coefficients of 0.95 and 0.96

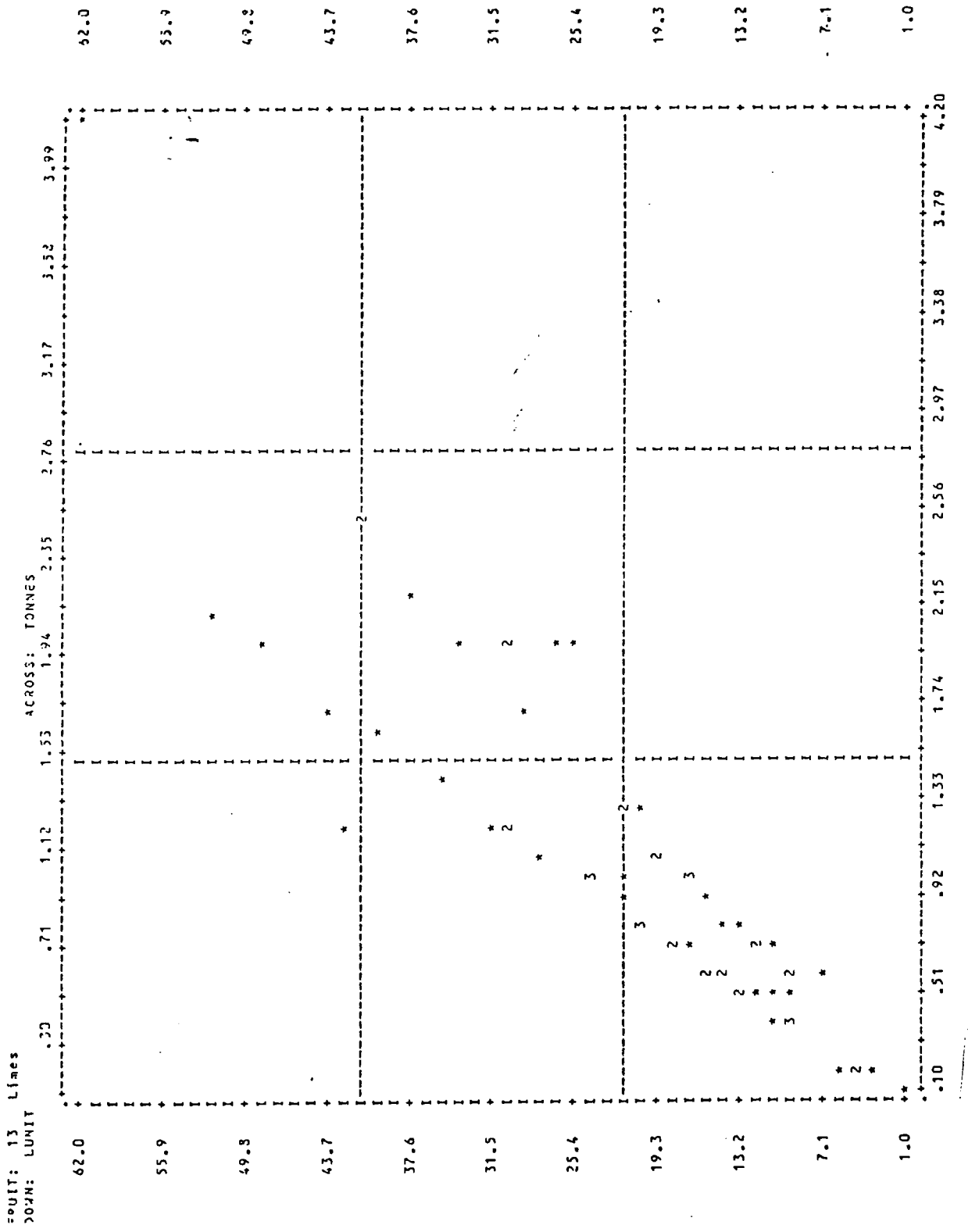


Scattergram Plot of the Local Units Against Metric Tonne Conversions

Figure 3.2

Figure 3.3

Scattergram Plot of the Local Units of Lime Deliveries Against Metric Tonnes Conversions



respectively. The rest of the commodities have correlations of not less than 0.97. The relationship is clear as the tonnage is estimated by KMC staff from the local unit. This simply gives a measure of the consistency in the calculation of the tonnage from the local unit. Of the three units mentioned above, the limes' lower coefficient may be explained by the fact that both *gunia* and *mfuko* are used as containers for transportation. This is indicated in Figure 3.3, where two main 'fingers' of distribution extend from the origin representing the different conversion factors.

Table 3.3 Approximate Conversion Table

Container	Description	Approx. Metric Volume [1]
gunia	large canvas sack	80-100 kg
tenga	oval woven basket	40-50 kg (small) 60-80 kg (large)
mfuko	discarded fertiliser bag	40-50 kg
ndoo	plastic bucket (20 litres.)	16-18 kg
ndebe	5 gallon cooking oil tin	16-18 kg
mkungu	bunch of bananas on the stalk	70-100 kg

1 the volumes vary depending on the size and type of commodity.
Source: various interviews and consultants' reports

On the whole, the correlations suggest that the conversions from local unit to metric tonnes assume an acceptable level of variation. Only limes score an r^2 value of less than the 90 per cent level of explanation. In all cases the level of statistical significance is less than p=0.00001. Conscious of these problems, and in the absence of an alternative, the estimates produced by these data nevertheless provide useful patterns and questions for purposes of analysis. Kariakoo is the most important wholesaling market in Dar es Salaam, therefore any patterns in supply which occur within the market are of crucial significance to the whole urban market. In addition, the patterns occurring in Kariakoo provide a basis on which it is possible, with additional evidence to make inferences about the rest of the city's fruit and vegetable market.

When produce arrives at the market, the volume is measured using these containers as a single unit. Pineapples, papaya and melons, although the latter are rare, are counted as single fruit units. The metric tonnage are calculated from these various local units by KMC staff using their experience and judgement. No facilities or space are available to weigh every batch of goods delivered at the wholesale market. The weight of the produce found in each sack or basket may vary for two reasons: firstly, the size of the containers is not consistent; and secondly, the density and size of fruit, and therefore the container, varies according to its age and variety. The agreed price will make allowances for the proportion of goods estimated to have been damaged.

These problems make calculating the weight in kilograms or metric tonnes from the number of local units very difficult. However, the problems of the data will be borne in mind in the analysis

and they will be balanced by use of alternative primary and secondary sources both in this chapter and later.

Data on the daily tally sheets available at Kariakoo indicate the origin of each batch of produce arriving at the market, along with volume of the batch, the types of produce, the registration of the vehicle and the name of the person delivering. However, the indication of the area of origin can be vague and inconsistent, ranging from reporting a village to a region.

The only indication of the area of origin available in the monthly and daily delivery reports, from which the data for this study was taken, were for tomatoes. A group interview of operations staff and their manager produced the following list of Kariakoo's sources of tomatoes, in order of importance: Lushoto, Iringa, Mbeya, Morogoro, and, finally, Dodoma and Ruvu were considered to be roughly equal in importance. The latter two areas, Dodoma and Ruvu tend to supply only rarely, accounting for approximately 50 *matenga* per year. Tomatoes from Lushoto mainly come from Mkeiya in Lushoto District. KMC divide the tomatoes into the following four groups: Lushoto/Mbeya; Moshi/Dodoma; Morogoro/Ruvu/Mkaiye; and Iringa. These divisions reflect the four different tomato varieties, rather than any geographical factors.

The quantitative data collected from Kariakoo are taken from daily and then monthly composites of the forms which tally clerks complete as they count the commodities entering the market. All of the data handling for the wholesale market is carried out by hand and the records are kept on paper in one of the wholesale market's store rooms in the basement. The only use made of these data is in the calculation and monitoring of commission charges. The monthly and daily data are rarely used when it is beyond one year old and their records are subject to the very humid conditions found in Dar es Salaam, and particularly in Kariakoo's basement. Paper left in these conditions for a long period mildews and, after some time, becomes unusable.

A representative, but manageable dataset was required for processing. Therefore, a sample of data from one randomly selected day from each week from January 1987 to August 1989 was taken. The data before this time were incomplete and often difficult to read because of the physical deterioration of the records due to high humidity levels in the storeroom. A table of random numbers was generated using a pocket calculator with the relevant function (Appendix 3.6). Using this table, a day from each week was selected as follows: a number 1 would select a Monday, a number 2 a Tuesday, and so on up to number 7 selecting Sunday. Any numbers greater than 7 were ignored. Using these randomly selected days, data from each day were extracted for the the sixteen fruit and vegetable commodities Kariakoo Market Corporation consistently record data. A number of minor commodities, such as limes, paw paw, peas and ladies fingers (okra) were amalgamated with other commodities or only appeared on the records on a seasonal basis.

Data were also collected for the aggregated monthly figures from January 1981 to August 1989. This gives a broader, longer term view of Kariakoo Market's commodity deliveries. These data are limited to the same sixteen commodities used in the daily samples, for the same reasons. The monthly volumes in local units are used by Kariakoo staff to calculate the volume in metric tonnes. However, the mean monthly price refers to the price for the commodities measured in local units. In order to obtain comparable data, the author calculated a mean monthly price per metric tonne using the monthly value and monthly volume data and this is what will be referred to in this study as Kariakoo's mean monthly price. The Kariakoo Market Corporation data on mean monthly price based on the local unit will be ignored for the purposes of this study. The results of the analysis of this data are presented in Chapter Four.

A considerable quantity of secondary data was also obtained from the Marketing Development Bureau, a department of the Ministry of Agriculture. These data comprised monthly reports from records of retail market prices for a selected range of fruit and vegetables in Dar es Salaam and the markets of Dar es Salaam's chief supply regions. The data used in this analysis are collected by the Marketing Development Bureau (MDB), a Food and Agriculture Organization and United Nations Development Programme funded office within the Tanzanian Ministry of Agriculture and Livestock Development (KILIMO). The collection of the monthly prices constitutes part of the activities of the Market Information Service (MIS) run by the Marketing Development Bureau. This involves approximately 30 KILIMO personnel, in 30 market towns throughout Tanzania, in the collection of fortnightly prices of 21 food commodities. The monthly mean of these is then calculated and recorded in the MIS's Monthly Market Bulletin.

This analysis will examine price data collected for the seven commodities which this data set shares with the data already obtained from Kariakoo Market Corporation. These commodities are onions, tomatoes, ripe bananas, cabbages, oranges, coconuts and Irish potatoes. In addition, the data examined here will be limited to six towns, representing the main supply areas for the city of Dar es Salaam; these are Iringa, Lushoto, Mbeya, Morogoro, Moshi and Tanga. The data have been recorded on a monthly basis since June 1983, except in the case of ripe bananas, where the series begins in November 1984. The data presented in this chapter include data collected up to July 1989, shortly before the dataset was obtained by the author from the Marketing Development Bureau.

As the time series of the data is relatively short, price variations across time will be analysed by highlighting the long term trend through analysis of the mean annual commodity prices. The price obtained from the Marketing Development is transformed using United Nations published Tanzanian Consumer Price Indices as a deflator to measure the price changes in real terms by calculating the prices at 1983 Tanzanian Shilling values. The method of calculation involved the calculation of a 1983 Tanzanian Shilling in the subsequent years of the time series. The annual mean prices are then multiplied by this value to produce the deflated 1983 prices (TShs(1983)) for all the commodities for the entire series. These mean annual real prices are then used to

calculate a mean annual market price margin by subtracting the market town prices from their equivalent Dar es Salaam prices.

Seasonal price changes are analysed by calculating the monthly mean price using the current price values. These monthly means are then used to calculate the monthly mean margins by subtracting the market town means from the Dar es Salaam monthly means.

3.1.4 Data Analysis

All the data, both primary and secondary were entered on mainframe computer and analysed using SPSS^X statistical analysis package. Some data, particularly the results of the analysis of the Marketing Development Bureau database were summarised using Microsoft Excel, a spreadsheet package. In addition, the data have been presented in graphical form, using Cricket Graph, where it was considered this form of presentation would enhance the clarity of the discussion.

3.2 The Rural Producing Study Areas

The rural section of the field research took place in two different locations in Tanzania. Both are considered of significance in the supply of fruit and vegetables to the city of Dar es Salaam. There follows a description of the two study areas, with particular attention to their potential in the production of fruit and vegetables.

Morogoro Rural District

The first of the selected rural field areas is located 200 kilometres west of the city of Dar es Salaam. The areas of interest to this study are located on either side of the Uluguru mountain block, and ranges in altitude from 1,200 metres to 1,800 metres. They have been described as being very similar in ecology to areas of Lushoto in Tanga region in the north of Tanzania, "with vegetable growing offering about the only major possibility for a cash crop" (Marketing Development Bureau, 1973). The monthly mean temperatures range from 10 °C to 30 °C at Langali village (1,200 metres) and from 4 °C to 18 °C at Tchenzema village (1,800 metres). Rainfall reliability can be a problem, particularly in lower altitudes where drought has been experienced. In the higher altitudes, however, ample water is available in the rainy season in the form of the rainfall, and from the springs and rivers in the dry season. Highly developed systems of terraced irrigation are evident in the area from below Langali Village up to Tchenzema Village, where irrigation makes it possible to obtain up to 3 crops per year depending on the vegetable (Marketing Development Bureau, 1973). For example, it is possible to grow cabbages all year round at altitudes up to 1,800 m, according to Paul (1988), although harvesting between November and January is limited. Given an assured supply of

inputs and good weather conditions, it is possible to produce three cabbage harvests per year.

During the British colonial period British, Afrikaans and some French settlers brought more 'exotic' fruit and vegetable varieties into the area, including peas, carrots, and salad vegetables (such as Chinese lettuce and cucumbers), increasing the diversity of commodities being produced and sold to the Morogoro market, where the settlers held the monopoly. As the settler economy became more established, with indigenous children requiring school uniforms to attend the missionary schools and some consumer goods becoming more available, cash became increasingly important to the previously subsistent peasant households. Thus, more were persuaded of the value of entering the cash economy. In the late 1940s, missionaries began selling fruit and vegetable seedlings cheaply encouraging an expansion of production. This coincided with the encouragement of the use of terraces to protect the soils and the introduction of yet more varieties of produce.

Traditional systems of production began to disappear as more modern techniques were encouraged. The Waluguru had already begun an expansion of the cultivated land area into the natural forest of the mountains, to the extent that little of the original forest remains, and the leopards who once inhabited the forests are no longer seen in the area. The increasing population had also begun to exert pressure on the land's ability to sustain the traditional agricultural practices. When the colonists arrived with new innovations for increasing the productivity of the land the Waluguru were receptive. With the advent of the market economy, in particular, land transactions for money slowly became more common. It has been argued that the conversion of the Waluguru to Catholicism served to emphasise individualism and male-headed family kinships at the expanse of the matrilineal clan system (Paul 1988). The result has been that payment of rent in cash by tenants has increased. Intense competition for land has been reported, with tenants planting trees on land to add to claims for rights of ownership, where previous agreements had been vague. Delobel *et al* (1989) reported that an unexpected 33 per cent of farmers gave this as their reason for planting trees, and that more recent evidence suggests this is an increasingly important motivation.

Intensive production of fruit and vegetables began in the Mgeta area in the early 1950s (Paul, 1988; Hadjivayanis, 1987; Marketing Development Bureau, 1973), this expansion roughly coinciding with the departure of most European producers from the region. In the 1960s, a second major expansion in production came about after the opening of the Kireka Fruit Nursery, in Morogoro town. Sales of seedlings from this nursery, which is now of national importance in the stocking of fruit seeds, increased from 12,000 in 1966 on its opening, to 70,000 in 1971. According to the Ministry of Agriculture extension workers in the Division, this level of sales has been more or less maintained since then. Estimates of vegetable production, for example, show increases of 25 per cent each year from 1966 to 1970, from 1,760 tons to 3,740 tons (Table 3.4).

The Marketing Development Bureau estimates that Tchenzema was producing up to 90 per cent of Morogoro Region's total production by 1971 (Marketing Development Bureau, 1973). Much of the Region's fruit production is accounted for by the area around Matombo where citrus fruits, mangoes and bananas are produced in large quantities. No data were available to allow an estimate of the level of production of fruit in Matombo; however, the area is considered in Dar es Salaam to be an important source of these commodities.

Table 3.4 Tchenzema and Morogoro Fruit and Vegetable Production 1967-71 (Imperial Tons)

	1967		1968		1969		1970		1971	
	Veg	*Fruit*	*Veg*	*Fruit*	*Veg*	*Fruit*	*Veg*	*Fruit*	*Veg*	*Fruit*
Morogoro Region	6,911	800	6,911	914	9,177	4,116	5,000	4,000	8,000	5,500
TVFCS*	400		250		720		900		650	
Private Purchases**	750		2,100		2,000		2,500		1,950	
Total Tchenzema Production†	1,100		2,400		2,980		3,740		2,840	60††

* TVFCS - Tchenzema Vegetable Farmers' Cooperative Society
** Estimates.
† These estimates includes an estimated 10 per cent of produce consumed on the farm.
†† Fruit production is relatively less important in this area because it is suited to the production of sub-tropical and temperate fruit. There is not a great deal of demand for this type of fruit in the country.

Source: Marketing Development Bureau, 1973

The most recent data available showing the Region's output are taken from the Ministry of Agriculture's regional office report to the National Horticultural Seminar in 1983 (Table 3.5). It can be seen that the Region produces significant quantities of fruit and vegetable, particularly when compared to the volume of fruit and vegetables which passes through Kariakoo wholesale market, which is around 70,000 metric tonnes; indeed, it was estimated in 1973 that the Region was capable of producing 60 per cent of Dar es Salaam's vegetable requirements (Marketing Development Bureau, 1973).

Table 3.5 Morogoro Regional Fruit and Vegetable Production 1980-83 (metric tonnes)

Crop	1980	1981	1982	1983
Vegetables	82,780	68,743	126,510	161,213*
Fruit	54,575	52,695	70,626	75,500*

* Estimated

Source: Ministry of Agriculture, 1983

The original rationale behind the choice of the Rural District of Morogoro is clear, it is the closest high land area to Dar es Salaam, which provides sub-tropical and temperate climates for the production of fruit and vegetables. After interviews and discussions with market officials, retailers and consumers, it was clear that Mgeta was an important producing district for temperate vegetables such as cabbage, lettuce, carrots and peas, and that Matombo was equally important for citrus fruits and mangoes.

Lushoto District

The second producing district selected was that of Lushoto in Tanga region. Lushoto District can be divided into two distinct zones according to physical geographic characteristics, the West Usambara Mountains and the Umba Plains. The Umba Plains are a continuation of the plains which stretch from the coastal area through Muheza and are broken by the sharp rise of the dome-shaped peaks and ridges of the Usambara Mountains. The Umba Plains are, like the plains in Muheza and on the coast, relatively warm, but they are in the rain shadow of the mountains and therefore have little rainfall, recording only 500-600 mm annually (TIRDEP, 1985). These are not suitable for sustainable agricultural production, and most of the area is bush land with occasional areas of swamp. They are mainly given over to the Mkomazi Game Reserve and were, therefore, not considered in the study.

The West Usambaras can be comparatively cool, with temperatures dropping as low as 0 °C during the cold season between April and August. Mean monthly temperatures lie between 16 °C and 22 °C. The Usambara Mountains range from 800 metres to 2,000 metres in altitude, with mainly natural forest cover on the peaks and ridges of the mountains. Non-laterite red and grey loamy mineral soils are to be found on the mountain slopes, while grey to black, fresh mineral soils are found in the valley. The natural vegetation has been cleared for cultivation from almost all of the area except for the very mountain tops, with slopes even of up to 80 per cent gradient being cultivated (Sender and Smith, 1990, p.9). The occurrence of frost is rare, but, nonetheless, a possibility. Mean annual rainfall ranges from 1,200 mm to 1,400 mm (Sender and Smith, 1990) but rainfall levels as low as 600 mm and as high as 2,000 mm have been recorded (SECAP, 1988; TIRDEP, 1985). Two distinct rainy seasons can be distinguished: the long rains from March to June (in Kishambaa called *Masika*) and the short rains, from November to January (called *Vuli*).

Table 3.6 Population Change in the West Usambaras

Year	1978	1984	1988
Population	266,181	304,000	334,435
Increase	No data	37,819	30,435
Density (persons/km^2)	153	175	192
Mean Annual Growth Rate	No data	2.4	2.5

Source: TIRDEP 1985 and Government of Tanzania 1989.

Cliffe *et al* (1975) have suggested that the most frequently stated problem of Lushoto's development crisis is overpopulation. The mountains have one of the highest rural population densities in Tanzania; in 1978 this was 153 persons per km^2. By 1984 this had increased to an estimated 175 persons per km^2. The 1988 census of the District reports a population of 357,255, with an annual increase of 2.5 per cent, and a population density of 192 persons per km^2 (Table 3.6). Although the annual population increase is not as large as the mean national

growth rate, the male-female ratio of 83:100 gives an indication of the high level of male out-migration in the area.

There is no identifiable soil type which is common to the Mountain area, as they vary considerably over relatively short distances. According to Sender and Smith (1990), the soils of the Usambaras may be characterised as acid and lacking in nutritional value, with the predominant soil type being a red laterite soil, with shallow organic topsoil. The laterite soils tends to be found on the wetter higher slopes under forest and are most susceptible to deterioration. Cliffe *et al* (1975) identify more fertile hillslope soils, including red and grey loams and grey-to-black fresh soils, which, with conservation techniques such as contour strip cropping, contour hedging and even retaining walls in places, provide good farming. In addition, there is valley colluvial, providing very fertile soils in a good situation for irrigation. Photograph 3.1 shows a good example of an intensively cultivated valley bottom near Soni Village. Note the careful channelling of the stream and irrigation channels between the plots, and also the contour cropping of grasses above the right bank of the stream to reduce soil erosion.

The farmers of Lushoto have gradually entered into the production of commodities through two channels (Cliffe *et al* 1975). The first began with the introduction of settler farms and, more recently, has involved a small number of wealthy farmers and state bodies who have bought into these large production units. These farms are generally large scale and run on commercial lines, requiring significant capital and labour inputs. This has created a class of land owners and a class of labourers, (Cliffe *et al*, 1975).

Secondly, those with sufficient land to be agriculturally viable are able to begin commercial production of cash crops on a small scale. Fruit and vegetables became an important market for this area because of its temperate climate, and, with irrigation, it is possible to produce more than one harvest per year. The arrival of European settlers and missionaries brought in many new varieties of fruits and vegetables which were able to mature at much faster rates than the traditional subsistence crops, as in the case of Mgeta. Indeed, Delobel *et al*, (1989) report that the first species of temperate fruit trees to be planted in Tanzania were planted in Lushoto.

As the population in the area has increased, increasing in turn the pressure on the land's carrying capacity, there has been tremendous pressure on the producers to increase output to retain economic viability. This was attempted initially through the expansion of cultivated land into some of the last natural forest areas of Tanzania, particularly in the 1960s when 3,000 hectares of forest reserve were cleared and distributed to farmers in the District (Taube, 1988). More recently, producers have adopted exotic varieties of fruit and vegetables and begun using agricultural inputs. For example, in the case of tomatoes, a farmer in Lushoto explained that different types of fertiliser are required at different stages in the tomatoes' growth. For a 2 to

Photograph 3.1

Valley Bottom Cultivation near Soni Village, Lushoto District[1]

1 Original in colour

2.5 hectare plot, he estimated that he would use 100 kg of Triple Super Phosphate when transplanting the tomatoes from the nursery to the field, 100 kg of Sulphur Ammonia when the plants' flowers begin to appear, and 100 kg of NPK compound fertiliser when the fruits begin to appear. If he planted the tomatoes to time their harvest for the peak in market prices, at the end of the long rains (from February to May), he would also require fungicide, preferably Dithane M45, which he would apply at a rate of 50 kg per hectare per month for three months. However, during the survey it became apparent that the inputs were becoming increasingly difficult to purchase. Only producers with access to significant amounts of capital were in a position to obtain such inputs, as they were usually only available on the black market at inflated prices. For example, one farmer reported that Dithane M45 sold at TShs 25,000 per 25 kg sack, although fertilisers generally sell for between TShs 250 and TShs 1,100 per *debe* (approximately equivalent to 14 kg) depending on the type required. However, there are significant advantages from investing in these inputs if the capital is available. For example, one producer in Lushoto, able to obtain fungicides, now grows tomatoes during the wet season, harvesting them in time to be among the first producers to deliver tomatoes in Dar es Salaam in late May and early June. He reported that he was able to make a significant profit from the extremely high prices for tomatoes at that time of the year. In Dar es Salaam prices in excess of TShs 10,000 per *tenga* were reported in May 1989, when both earlier and later in the year prices of TShs 2,000 were accepted. However, given good conditions and inputs, with an estimated 10 kilograms of tomatoes per plant and 20,000 plants per hectare, this type of highly developed production is only possible for producers with significant quantities of capital and land.

3.3 Kariakoo Wholesale Market

Kariakoo Wholesale Market is of crucial importance to the fruit and vegetable supply system for Dar es Salaam. It is the only legal wholesale market for these commodities in the city. In spite of an increasingly important informal sector Kariakoo still attracts considerable quantities of produce. This section will describe the role the market plays in the city's food system, and the way in which the data used in this study is collected.

The history of Kariakoo dates back to 1914 when Tanganyika was a colony of Germany. On the site of today's Kariakoo Market a building was erected to house the celebrations for the coronation of Kaiser Wilhelm of Germany. After the First World War the British Carrier Corps used the coronation building as a camp during the capture of Dar es Salaam from the Germans and the name of 'Carrier Corps', with the Swahili spelling, was adopted as the name of the building, and subsequently of the area that was built around it.

In 1919, the building was turned into a market catering for the Dar es Salaam population, with goods being sold on the floor of the building until the 1960s when concrete and cement stalls were installed. However, it became evident, as the city's population expanded in the early

years of Independence, that the market was too small to cope with the volume of trade. Consequently, in 1970, after long discussions, the government finally approved the demolition of the old Kariakoo market building to make way for a "modern building of artistic design" (Marketing Development Bureau, 1985). This new building was planned to meet the needs of the city for its expected growth over the next 50 to 70 years (Photograph 3.2).

The current Kariakoo Market Complex consists of two floors in the main building (ground and upper), and a single level extension for the retailing of food, crafts, clothing, banking and other services (Figure 3.4). The wholesale market for fruit, vegetables and fish is in the basement of the main building. A street next to the main building is also used for the wholesaling and retailing of coconuts. The entire complex is owned and operated by Kariakoo Market Corporation (KMC), a company owned jointly by central government and the Dar es Salaam City Council. The main trading floor is 2,400 square metres, with products of the same broad type being grouped together on the trading floor. The trading floor is served by a through road entering and exiting the basement via ramps to and from the road level. The road passes at a lower level at one end allowing lorries to be easily unloaded onto the floor level from the eight loading bays. The loading bay area is about 1,000 square metres and during busy periods, including the period of this survey, part of this is used as a spill-over trading area.

Pedestrian access to the trading area is by two stairways at the opposite end of the basement from the access ramps. The area at this end of the trading floor is used for sub-wholesaling, because it is too far from the access ramps, and has a small number of stalls. The immense volumes of fruit and vegetables handled in Kariakoo have meant that all the storage rooms and cold stores have had to be opened up for use as trading floor space. The store rooms are mainly used for sub-wholesaling, because these are all located at the stairway end of the building and access to each room is restricted to a single door. Stalls have been provided for sub-wholesaling. The wholesaling of coconuts takes place on a side-street outside the market due to a lack of space inside the market building. This area consists of 1,700 square metres, of which 1,100 square metres is for wholesaling only.

When it was constructed in 1975, as the only legally specified wholesale market for fruit and vegetables in Dar es Salaam, the market was designed to deal with approximately 30,000 metric tonnes of produce per year. The wholesale market reported a peak annual delivery of 92,787 tonnes between July 1980 and June 1981, and has been handling approximately 70,000 tonnes annually since 1983. The only legal controls or interventions in the marketing of fruit and vegetables are that, firstly, the wholesaling must be dealt with in Kariakoo by KMC-registered auctioneers; secondly, the 'farmers' [2] delivering produce are subject to a 6 per cent

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2 Although called a "farmer" by the Kariakoo Market Corporation, the people bringing produce to the wholesale market may also be full-time commodity traders.

Photograph 3.2

Kariakoo Market Building from the South East[3]

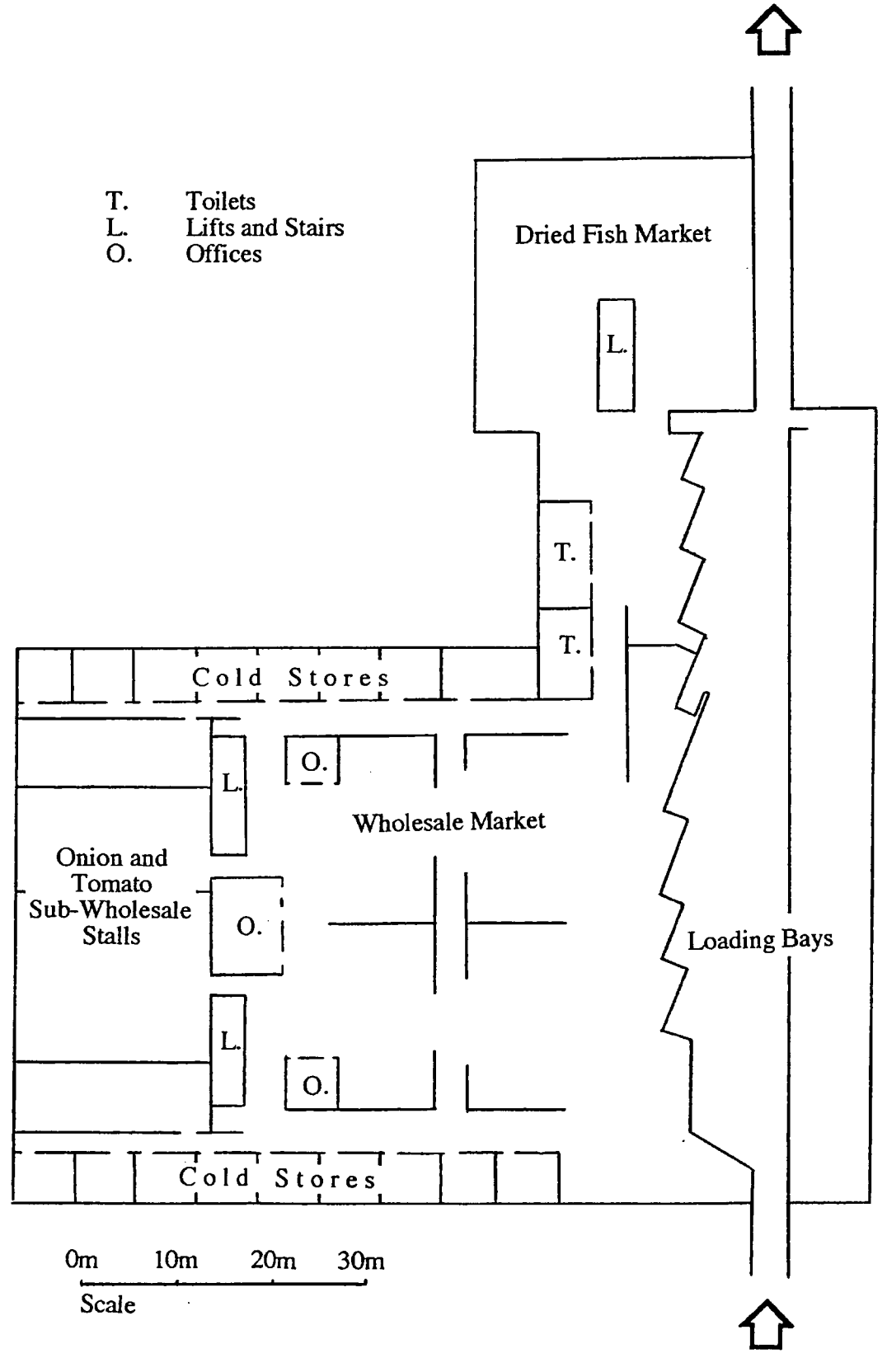
(Auxiliary retail market building in fore-ground)

3 Original in colour

Figure 3.4

Layout of Kariakoo Wholesale Market

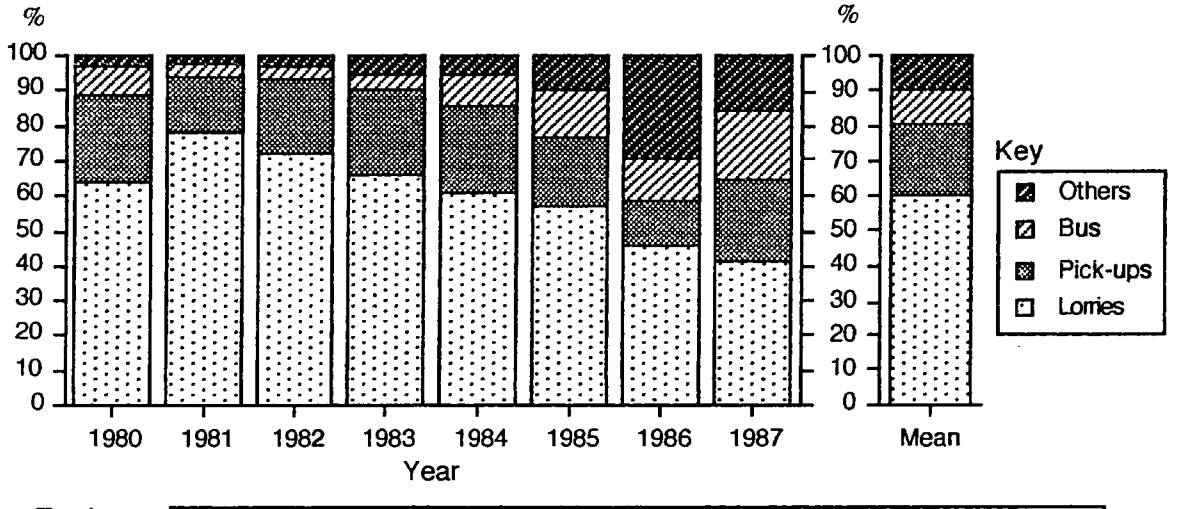
(Kariakoo Market Complex, Basement)



commission payable to KMC; and thirdly, the KMC advise maximum and minimum prices for each of the commodities, although these are not binding.

In reality, however, the General Manager of KMC is aware that, at the time the new market complex came into operation in 1975, it accounted for an estimated 90 per cent of Dar es Salaam's fruit and vegetable wholesaling, whereas now it accounts for an estimated 60-70 per cent. Indeed, Kariakoo has not been able to absorb the increased fruit and vegetable trade because of the physical constraints of limited capacity, as indicated by the relatively stable levels of goods passing through the wholesale market since 1981. An additional factor in the reduced importance of Kariakoo as a wholesale market is the attraction of avoiding the 6 per cent commission, which both 'pushes' and 'pulls' traders into 'informal wholesaling' on the 'parallel market'. This means that up to 40 per cent of fruit and vegetables entering the city of Dar es Salaam may not be levied a commission.

Figure 3.5 Types of Transport Delivering at Kariakoo Wholesale Market (Percentages)



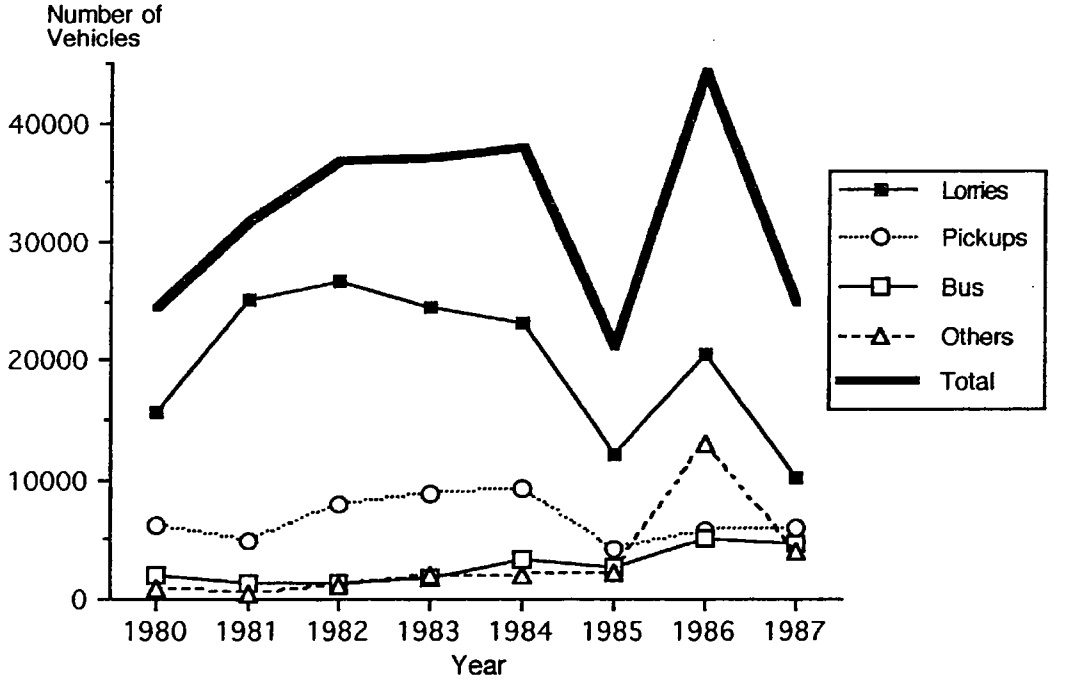
	1980	1981	1982	1983	1984	1985	1986	1987	Mean
Total Vehicles	24,585	31,768	36,917	37,083	37,895	21,110	44,325	24,853	32,317
Total Volume (M.Tonnes)	n/a	57,683	61,931	68,731	72,841	69,090	70,107	68,746	67,018

Source: Kariakoo Market Corporation Records, 1981-88

The produce arrives at Kariakoo market by a variety of means of transport including lorry, pickup and bus. Data were collected from KMC's Annual Reports for the different methods of transportation by which each fruit and vegetable delivery arrived at the market. The data available were for the years 1980 to 1987 and the percentage breakdowns are presented in Figure 3.5. The mean percentages show that lorries account for 61 per cent of the vehicles delivering fruit or vegetables at Kariakoo's wholesale market averaged over the time period 1980-87. It should, however, be pointed out that because the lorries have a far greater capacity than any other form of transport, they therefore account for a far greater proportion of the volume of commodities involved.

The percentage values plotted over time show that the number of lorries increased to account for 79 per cent of the delivery vehicles in 1981, but subsequently decreased annually to account for 41 per cent in 1987. The use of pick-ups peaks three times across the time period, with 25 per cent in 1980, 25 per cent in 1984 and 24 per cent in 1987. Between the peaks the troughs are 16 per cent in 1981 and 13 per cent in 1986. Over the period 1980-87, the annual average was 21 per cent. The use of buses shows a continued increase in importance throughout the period, after an initial drop from 8 per cent in 1981 to 4 per cent in 1982, climbing to account for 19 per cent by 1987. The 'others' category includes informal transport such as hitching lifts, taking a bus and carrying by headload or hand cart (*mkokoteni*). This category has seen a sustained increase from 3 per cent in 1980 to 29 per cent in 1986, before declining to a level of 16 per cent in 1987. Figure 3.6 is a graph of the absolute vehicle numbers and shows a general trend of increasing use of buses and 'other' modes of transport. In contrast, it also shows a decreasing trend in the use of lorries and the use of pick-ups.

Figure 3.6 Types of Vehicle Delivering to Kariakoo Wholesale Market



Kariakoo Market Corporation Records, 1981-88

The large increase of deliveries made by 'other' transport in 1986 - by a factor of three, and almost six times the number of the previous year - is exceptional and is difficult to explain using the data available from Kariakoo. An explanation must be sought in the wider economy of the country for the large changes in the delivery vehicles' profile for the years 1985 and 1986. In 1985 the Tanzanian economy was in severe difficulties. The Tanzanian government had been locked in bitter negotiations with the International Monetary Fund for five years, and the per capita income had declined steadily over the previous 5 years. Annual GDP growth, at 2.3 per cent, was unable to keep pace with the population growth of 3.3 per cent. The foreign trade

deficit was at an all-time high at 249 per cent of export earnings (almost double the previous year). The chronic lack of foreign exchange affected the availability and price of important imports such as petroleum and vehicle spares. The Structural Adjustment Programme had been in place for the whole of its three year period and no obvious benefits had accrued to the economy. All these effects on the nation's economy hit the Dar es Salaam fruit and vegetable suppliers by the increased cost of transport. As the increased cost of petrol and spare parts pushed up the cost of hiring a lorry for transporting, so the traders appear to have sought alternative and more efficient means of transport. This is demonstrated in the markedly increased use of 'other' forms of transport and also in the increased mean size of deliveries per vehicle shown in Table 3.7.

In addition to these issues, the question of why the number of vehicles in 1987 has returned to the 1980 level must be addressed. The year 1986 saw an increase in economic confidence in Tanzania, with the election of a new President and an agreement with the IMF, and subsequently, most other aid organisations, who had been awaiting the outcome of the IMF negotiations. These circumstances are highlighted by the fact that the number of vehicles delivering to Kariakoo dropped from 38,000 in 1984 to 21,000 in 1985 and then rose the following year to 44,000, while the total volume of deliveries to the market fell by only 3,000 to 69,000 tonnes and rose again by only 1,000.

Table 3.7 Mean Size of Delivery per Vehicle (metric tonnes)

Year	1981	1982	1983	1984	1985	1986	1987
Mean Delivery per vehicle	1.816	1.678	1.853	1.922	3.273	1.582	2.766

Source: Author's calculations from Kariakoo Market Corporation data

The contrast between these two years and the rest of the period is most clearly seen in Figure 3.6. This graph plots the number of vehicles against each year and shows the decline in 'formal', hired transport and the more 'informal' transport, such as buses and 'other modes'. The most striking aspect of this graph is the dramatic fall in the number of lorries and of pick-ups delivering to Kariakoo in 1985. These are the two main methods of transportation used by commercial traders delivering to Kariakoo, the lorries over long distances and the pick-ups over distances in and around the city and its surrounding region. Clearly, the increased cost of transport has forced many of these traders to seek alternative means of transport. Alternatively, this may be explained by the effect of giving each District authority the power to set up road blocks to prevent illegal flows of food. This constrained the movement of food, although from the evidence in Figure 3.5 it would appear that the deliveries continued, they simply arrived in different ways. In 1986 Prime Minister Sokoine ordered the relaxation of the flow of foods towards the main towns, and according to informants interviewed during the research, a 'blind eye' was turned to the unofficial use of parastatal vehicles in transporting of

food. This resulted in the number of lorries delivering to Kariakoo Wholesale Market increasing again, as does the number of pick-ups, but not to the same level. This may also be explained partly by the increased business confidence as the the Economic Recovery Programme was adopted, bringing with it agreements with the IMF, The World Bank and many of the country's major bilateral donors. The mean volume per delivery reduces again in this year. In 1987 the total number of vehicles returned to a similar level to that of 1980. However, the volume of deliveries per vehicle has increased again whilst the number of lorries and 'other' vehicles delivering to Kariakoo has gone down.

Lorries and pick-ups, hired for the specific purpose of transporting fruit and vegetables to Kariakoo, can be considered 'formal' modes of transport. In this case, the bus and 'others' categories are informal modes of transport. Dividing the transportation in this way reveals the trend from 1981 to 1988, that formal modes of transport have declined from a peak of 95 per cent in 1982 to 59 per cent in 1986. Consequently, the informal modes of transport have increased from 5 per cent to 41 per cent, ending the period at 35 per cent. This shift in emphasis, away from a reliance on specifically hired lorries and pick-ups, requiring greater initial capital outlay, reflects the increased transport costs associated with these two types, resulting from the continually increasing fuel prices and more expensive imported spare parts, caused by the unfavourable terms of trade.

These vehicles are met at the market entrance by a KMC tally clerk, who counts the volume of the various commodities in each vehicle. Once the vehicle's load has been counted, the vehicle is directed down an entrance ramp to a free loading bay in the basement, where the wholesale market is located. At the loading bay the produce is counted by a different tally clerk and the final total agreed with the 'farmer'. The value of the produce is then calculated, using the current minimum price, and a 6 per cent commission is levied on the supplier. The vehicle leaves the basement by a different exit ramp. The 'farmer' then negotiates a deal with a KMC registered auctioneer to have the produce auctioned on the trading floor, or he may try to sell direct to a buyer. The latter option has only been allowed in the last five years, before which a KMC registered auctioneer was the only person with which the 'farmer' could do business.

The buyer may be a sub-wholesaler, who will break the delivery into smaller quantities for resale to other buyers; a contract buyer, who buys on behalf of a large institution such as a corporation, a hotel or a prison; or a retailer, or group of retailers, who will transport their purchases to their retail market by pick-up or *mkokoteni*. This issue of transporting to the retail markets will be returned to in the next chapter.

A further source of fruit and vegetables, becoming increasingly important, is for Dar es Salaam residents to adopt the strategy of growing their own crops in or near to the city. It is very difficult to estimate how important this practice currently is, but observations around the city clearly demonstrate its importance; Dar es Salaam residents report that they and their

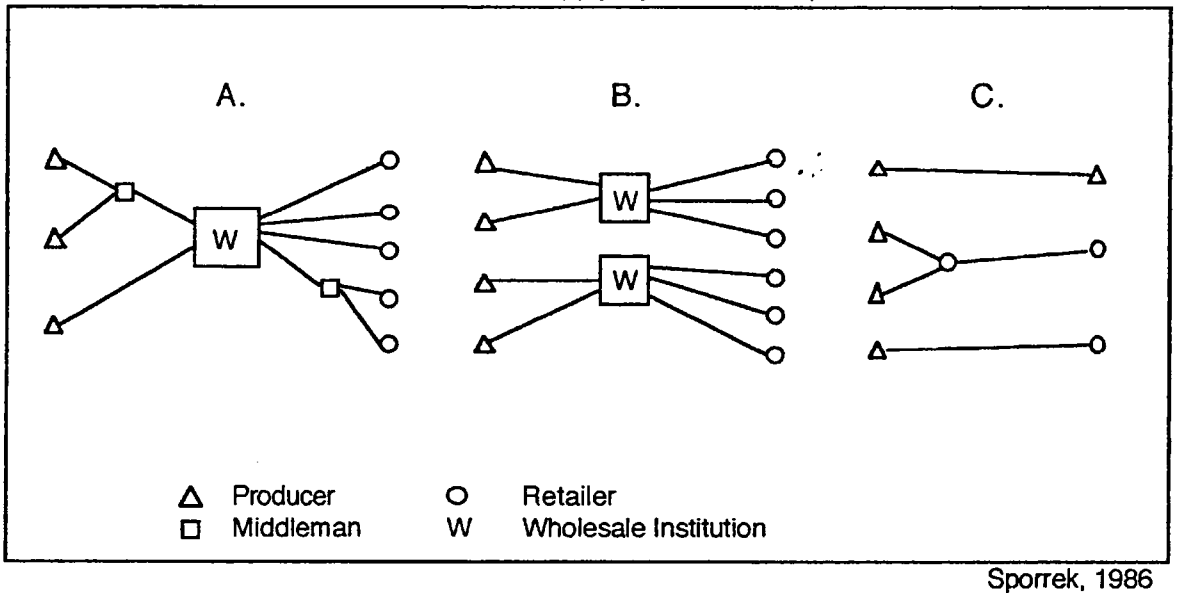
neighbours are increasingly turning to this strategy for obtaining food (see Briggs, 1990; 1991). Finally, the KMC are also aware that the maximum and minimum prices they set may have little bearing on the actual prices agreed on the trading floor. Kariakoo Market Corporation, when it was formed in 1975, was given the task of managing the only legal wholesale market for fruit and vegetables in Dar es Salaam. Within this market, however, the wholesalers are free to act, and KMC has no direct marketing involvement. As the managing organisation, KMC is involved not only in providing and charging for market facilities, but also administering a commission charge on the produce delivered at the wholesale market. In addition, one aspect of this management has been to set weekly maximum and minimum prices as a guide-line for market trading. In reality, however, there is little monitoring and no regulation of the negotiated prices, and KMC is aware that these guide-lines are frequently exceeded. The KMC interview what they call 'price leaders' to get an estimation of a fair range of prices for the commodities. It is on this basis that the guide-lines are decided. However, the differing sizes, qualities, and varieties of the commodities and the different conditions under which individual prices are negotiated, make this kind of price estimation very difficult. The maxima and minima, therefore, may exert some influence, but the settlement price is entirely between the buyer and the seller.

The large volumes of goods passing through the wholesale market cause problems for the provision and maintenance of a safe, clean trading environment. The storage and movement of commodities, and the disposal of a large amount of organic waste resulting from both rotted or damaged produce, as well as the materials used for packaging, is an increasingly important problem. The disposal of this waste becomes more crucial and more problematic, as the volume of goods and packaging material increases and the market becomes increasingly congested. The underground ventilation system is not adequate to cope with the high relative humidity (which can exceed 85 per cent), high temperatures (which can exceed 30°C), and the increased number of people and produce passing through the market.

Kariakoo was intended to play the central role in the distribution of fruit and vegetables to the Dar es Salaam population. The government-owned KMC was given a degree of control over the market, consequently, it vets and registers traders, monitors and levies a commission on produce entering the market, charges traders for market facilities and sets price guide-lines. In this way, it was hoped to bring the marketing channels under central control and protect the supply chain to the city population from speculators and racketeers. Sporrek (1985) discusses a number of stages in the development of an urban marketing chain system. Figure 3.7, presents a series of model supply systems, in which he argues that model A best describes the way Kariakoo was expected to fit into Dar es Salaam's food supply system. The models B and C are seen by Sporrek as previous stages in the development of a marketing chain resulting in a hierarchy of institutions involved in the marketing process. The previous stages involve, firstly, direct producer-consumer and producer-producer transactions, either by cash or by barter (Model C). Secondly, a system develops where a number of individuals with capital are able to begin trading full-time and facilitate the trade between the producers and consumers (Model

B). The final stage is where an organised state intervention facilitates the marketing and at the same time regulates the prices, ensuring a minimum of exploitation by the middlemen.

Figure 3.7 Sporrek's Models of Food Supply System Development



Sporrek, 1986

Clearly, in 1976, when Sporrek (1985) carried out his fieldwork, it could be argued that the Dar es Salaam marketing chain had reached Stage A. Table 3.8 gives the responses of retail sellers of various food commodities to the question as to their source of supply. The lowest percentage response for Kariakoo is for spinach at 85 per cent. Twenty out of the twenty-five commodities listed have 95 per cent or more sellers buying from Kariakoo. Since that time, however, Kariakoo has reached an apparent wholesale ceiling capacity of approximately 70,000 tonnes annually. The increase in demand for fruit and vegetables in Dar es Salaam can reasonably be expected to follow the growth of population; given the intercensal population growth rate for Dar es Salaam (1978-88) of 4.8 per cent per annum, and KMC's acceptance that Kariakoo accounts for a decreasing percentage of the market, this suggests that the concurrent increase in demand for fruit and vegetables is being met through other channels. This being the case, Kariakoo will account for a decreasing proportion of the city's wholesaling activities, with 'farmers' seeking alternative sources for their produce.

The fruit and vegetables are packed by the producers or the transporters into a container that is both easily handled and gives a level of protection to the goods. Three types of containers are used for long distance transportation: a large oval basket (*tenga*), accounting for 40 to 80 kilograms; a large canvas sack (*gunia*), accounting for 80 to 120 kilograms; and a used heavy duty plastic fertiliser bag (*mfuko*), accounting for 40 to 60 kilograms. Pineapples, being a much larger and also far more robust fruit, are usually transported loose. In addition, cooking bananas, also relatively robust, are transported on the large stalk on which the bunches of bananas grow. A 'stalk' of bananas is known as a *mkungu*, and may contain up to 150 bananas.

Table 3.8 Dar es Salaam Retailers' Sources of Fruit and Vegetable Supply in 1976

Item	Number of Sellers	Sources of Supply: Kariakoo	Ilala	Own Prod.	Other	No Answer
Onions	1256	1197 (95%)	18	-	27	14
Tomatoes	1073	1033 (96%)	15	2	7	16
Oranges	1056	1034 (98%)	11	1	1	9
Coconuts	753	741 (98%)	-	2	2	8
Bananas	698	683 (98%)	4	-	1	10
Limes	497	478 (96%)	10	-	-	9
Mangoes	449	438 (98%)	2	-	-	9
Lemons	378	374 (99%)	4	-	-	-
Ladies Fingers	337	332 (99%)	3	-	-	2
Tangerines	301	297 (99%)	3	-	-	1
Irish Potatoes	210	208 (99%)	-	-	-	2
Cabbage	175	164 (94%)	1	-	4	6
Spinach	120	102 (85%)	2	9	-	7
Beans	102	88 (86%)	-	-	5	9
Paw paw	99	96 (97%)	-	-	3	-
Peas	34	33 (97%)	1	-	-	-

Source: Sporrek 1985

Tomatoes, ripe bananas and occasionally oranges are transported in the large oval baskets (*tenga*). There are two general sizes of baskets referred to by market traders interviewed. The first, and by far the most common according to the informants, holds about 60 to 80 kgs of produce, depending on the type of commodity. The second, which is comparatively rare, is usually about half the size, holding 40 to 50 kgs. The baskets are wide, but shallow, and therefore give some protection to the more delicate fruit usually carried in them, by their more rigid basket material and by restricting the number of fruits that can be stacked on top of each other inside the container. Alternatively, coconuts, Irish potatoes, onions, cabbages, oranges and occasionally green mangoes are packed in the large canvas gunny sacks, containing anything from 80 to 120 kgs of produce. Ripe mangoes, green mangoes, lemons and limes are transported in the heavy-duty plastic bags, which generally carry approximately half the weight of the sacks. Their smaller size allows more care to be taken in handling and restricts the combined weight of the contents reducing the possibility of crushing the fruits packed at the bottom of the bag.

Perishability is a second major problem in the transportation of these goods. The process of decomposition begins as soon as the fruit or vegetable has been picked or harvested (Jones, 1987). This process can be slowed by keeping the goods in low temperatures and preventing damage by bruising. Refrigeration and refrigerated transport would clearly be the ideal solution. However, the capital investment involved in this type of technology is not available. Temperature is kept at a reasonable level by the ventilation given by the holes in the baskets and, to a lesser extent, in the sacks. If, however, grass or some other type of organic material is used to give extra protection, this may reduce any possibility of ventilation. This additional packing material, unless dried, also decomposes and, if kept in unventilated conditions, begins

to generate heat as a by-product of the decomposition process, accelerating the perishing of the commodities it is supposed to protect. In the case of the *mfuko*, or plastic bags, of course, ventilation through the material is impossible. Jones (1987) suggests that attempts to store fresh produce in Tanzania have tended to rely too mush on expensive technology. For example, he suggests that in order to store fruit at a temperature of 10-12° C "a simple fan blowing air into a store through as box containing straw with water dripping through is an effective device which also has the advantage of maintaining the humidity required to prevent the fruit from drying out" (Jones, 1987, p.26-27). He also suggests that it would be extremely profitable to examine the possibility of using recently developed technology in solar powered refrigeration, although, with the caveat that at this time the fresh fruit market is not developed enough to financially justify this level of investment.

The problems of perishability and the lack of refrigerated transportation and storage facilities mean that the fruit and vegetables must be transported rapidly to Kariakoo, so as to arrive in time for early trading and to be rapidly passed down the distribution chain to the retailers. Long distance bus travel and road transportation in Tanzania is generally carried out overnight to avoid the high temperatures experienced during the day, often exceeding 30°C. This overnight journey also brings the produce to the market at the opening of the day's wholesale trading at 5 am.

3.4 Dar es Salaam Retail Markets

Mwenge Market

Mwenge market is situated on the corner of Bagamoyo Road and Sam Nujoma Road (Figure 3.1 and in Photograph 3.3). The market began developing beside the important bus terminal, which is also located at this junction, in 1975. The site was officially taken over by the city authorities in 1977 and the market currently has 75 registered retailers, who each pay TShs 500 per year or TShs 20 per day for their stall. This contributes to the provision of a secretary, water and a telephone. Another TShs 200 per stall per month is paid to the city council, who are responsible for maintaining the stalls and clearing rubbish.

The market traders generally buy their produce from Kariakoo wholesale market. Notable exceptions to this are those selling *mchicha*, a type of spinach, which is widely grown on waste land or urban garden plots around the city. In addition, between August and October, tomatoes are bought from Kunduchi village, a little further along the Bagamoyo Road, to be brought into Mwenge for sale, as these are often cheaper and fresher than those available elsewhere.

Photograph 3.3

Stalls inside Mwenge Market, Dar es Salaam[4]

4 Original in colour

Typically traders purchasing from Kariakoo take a bus to arrive there at about 5 am every morning in order to purchase their produce. They then usually hire a pick-up or a car to transport the produce back to their market. Where smaller amounts are involved traders will either group together to hire a pick-up, or return individually with their produce by bus. During the survey, a number of the retailers reported that one trader, who has a stall at the market, tried to sell fruit and vegetables in wholesale quantities to the other market retailers. The retailers were generally reluctant to agree to this, as it meant that they did not know what the market price for the commodities was in the main wholesale markets. In the main, the retailers preferred to go to purchase their commodities themselves. Although this meant longer working days and the additional cost of transporting the commodities to the retail market, the traders interviewed expressed concern that buying from someone who supplied them at their own market place would mean that they would lose out on the possibility of obtaining a good price at the wholesale market. They feared losing the margin they were able to make by having to pay someone else to deliver to them, when they could do this themselves.

When pressed, the market secretary did acknowledge that, in spite of Kariakoo having the legal wholesale monopoly, some retailers went to Tandika and Tandale markets in search of wholesale goods. He went on to say, however, that it was difficult to estimate how many did this. He suggested that Kariakoo remained the most important source for fruit and vegetables for Mwenge retailers, followed by Tandale and then Tandika. The market secretary reported that, to some extent, the sources of produce depended on the season. For example, in the case of oranges, when oranges from Kilwa (Lindi Region, south of Dar es Salaam) are in season, Tandika is the best market, and Mwenge retailers sometimes travel to purchase oranges there. When oranges from Tanga or Morogoro are in season, Kariakoo or Tandale are the better markets. In the case of Tandale, this is because of its location on the main road into Dar es Salaam from these source areas, providing it with a prime site for off-loading arriving lorries. In the case of Kariakoo, it has off- and on-loading facilities unlike other markets, and it also has the additional advantage, of being the only legal market. For Mwenge traders Kariakoo is also the main source for cabbage, carrots, onions, peas and apples, and competes with Ubungo and Manzese for bananas, and with Tandale for mangoes. Potatoes mainly come from Manzese or Tandika (Table 3.9).

Table 3.9 Summary of the Main Wholesale Sources for Mwenge Market

Source	Commodities
Kariakoo	oranges, cabbages, onions, bananas, carrots, peas, apples, mangoes
Tandika	oranges, potatoes, tangerines, pawpaws
Tandale/Manzese	bananas, mangoes
Kunduchi	pawpaws, tomatoes
Ubungo	bananas

Source: Interview with Mwenge Market Secretary

Tandale Market

Tandale market was established in 1979 by Dar es Salaam City Council in an attempt to move market trading, which had developed spontaneously at the side of Morogoro Road at Manzese, away from an already highly congested urban artery. The city council initially constructed concrete huts and stalls and a permanent roof, and as the market has expanded, traders have added temporary stalls and shelter around the permanent trading area. The market place has expanded rapidly and has become a very busy, heavily congested area, with pedestrians mixing with large trucks and pick-ups. The main activities of the market fall into two parts, the wholesale section, which operates around the formal market building, and the retail section which exists within the main building.

Tandale's location, close to the main road from Morogoro and north and central Tanzania, makes it ideal for a delivery point for transporters of fruit and vegetables, as well as for staple foods. Since the liberalisation of the staple markets, Tandale has been legitimised as an important wholesale source of cassava, millet and maize, but is it also a good unofficial source of kidney beans, citrus fruits, mangoes, bananas, tomatoes and sugarcane.

While carrying out the survey at Tandale, the author interviewed a revenue collector employed by the Kariakoo Market Corporation to collect levies for those engaged in wholesale dealing of tomatoes, onions, sugarcane, bananas, and the other non-staple foods that should by law be sold through Kariakoo. He said that the reason for producers and retailers dealing outside Kariakoo was to avoid the levies which are charged there. He reported that KMC has revenue collectors who are also sent to Buguruni and Ubungo, but he acknowledged that they have a very difficult job to do, since the KMC offers no facilities at these sites and they cannot force the traders and dealers to pay, so they have to make concessions, and rarely are they able to collect the full levy.

Often those coming to Tandale have small quantities and do not wish to get involved with the bureaucracy of the Kariakoo wholesale market. It is easier to sell a small quantity undetected at a market such as Tandale. Nevertheless there are still those who prefer to go to Kariakoo because it provides facilities which are particularly useful for those with large loads. It is possible to lock the building at night, there is electricity for lighting to work by, particularly important early in the morning when produce is being bought by city retailers and being delivered by lorries from up country. In Tandale, according the KMC levy collector, himself, there is "... no light, no security, no nothing".

A typical negotiation over this commission charge between the revenue collector and the trader would take the following lines: the delivery from a *shamba* [5] is likely to consist of 20,000 oranges,

5 *Shamba* is the Swahili word given to the traditional small farm.

at 250 per *tenga* [6], making 80 *matenga*. The revenue collector will approach the trader, who has brought the batch to the market and point out the levy which is charged on all fresh food brought into Dar es Salaam. At the time of the interview (August 1989) this would be TShs 54 per *tenga* for oranges, making a total for the load of TShs 4,320. The trader would point out that he had not been able to sort through his goods since arriving and about half would be wasted and unsaleable and, therefore, not taxable. Intense negotiations would be entered into at this point each arguing their case until a proportion of wastage is agreed, including perhaps a discount for not actually using Kariakoo's facilities and often limited by what the trader claims to have in cash. The compromise payment is then worked out and the two parties agree.

There are approximately 100 wholesale traders operating in Tandale, although the number varies throughout the year. There are no records of wholesale traders and so it is difficult to know how accurate an estimate this is. The wholesalers selling fruit and vegetables have constructed their own stalls, which generally consist of woven palm leave dividers used to create a large, shallow basket into which the fruit is piled. The traders sit behind these piles and sell their goods.

The wholesale market for staple foods exists at the same site. The staple grains are transported in large hessian sacks (*gunia*). These are piled up to heights of up to six feet and the traders are often found sitting on top of these piles. Large lorries travelling in to Dar es Salaam to deliver to this staple wholesale market or to elsewhere in the city, often pick up farmers with their produce and take them into the city for an arranged fee. Alternatively the drivers may take the initiative themselves and buy produce to sell on arrival in Dar es Salaam. The market at Tandale is in a good position to capitalise on this business, as it is near one of the main arteries feeding into the city.

The retail area is located in the main building built by the city council in 1979. Many of the concrete stalls are used by those selling higher value goods such as fish or meat. The fruit and vegetable sellers are housed under wooden huts which were also built by the city. Traders have added their own stalls to this since the market opened. These sellers pay TShs 30 per day if they come for a short period. Those trading for a longer period pay TShs 500 per month as a maintenance fee to use the city built structures, while those in their own structure pay only TShs 200 per month. All traders pay TShs 500 per year for their licence, this works out at TShs 2,900 per trader per year in the self-built structures, or TShs 6,500 per year to use the city built stalls.

The temporary retailers tend to be either farmers who live just outside the city boundary, occasionally coming to the market to retail their own products and possibly also those of their neighbours, or, alternatively, Tandale retailers who travel out to Mbezi, buy from producers

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6 *Tenga* (plural: *matenga*) a large hand made reed basket for carrying more delicate fruit and vegetables, such as oranges, tomatoes or ripe mangoes.

there and return to Tandale to sell these goods. The revenue collector reported that those arriving from not far outside Dar es Salaam came by pickup, while those travelling a greater distance arrived by lorry or, less commonly, by bus.

Tandika Market

Tandika Market is a large market serving the southern part of Dar es Salaam where producers play an important part in the retailing and wholesaling process. The Market Secretary estimated that there are 485 fruit and vegetable traders, which includes all those selling on the streets outside the market. The City Council, which runs Tandika market, provides traders with refuse clearance, security (in the form of militia guards), and the use of toilets. In return, those traders who had use of huts provided for trading paid TShs 200 per month. Those who did not have use of a hut had to pay a levy on their sales. Examples of the levy rates are presented in Table 3.10.

Table 3.10 Levy Rates for Tandika Traders (August 1989)

Commodity	TShs per *Pakacha* [7]
potatoes	30
cassava	30
oranges	30

Source: Interview with the Market Secretary

The Market Secretary reported that produce arriving in Tandika comes mainly from Rufiji, but also from the fringes of southern Dar es Salaam near to the Kilwa Road, the main road leading south from the city. Other key supply areas include Kimanzachana, Mkulanga, which are both on the Kilwa Road, and Ikwiriri in the Rufiji Basin. According to him a great deal of produce arriving at Tandika arrives direct from the rural areas to the south of the city, although he did say that cabbages mainly came from Kariakoo. Vegetables such as cabbages require cooler climates, which are not available along the coast south of Dar es Salaam. It is likely, therefore, that the reason cabbages sold in Tandika are bought from Kariakoo is that they are supplied to the city by traders from the northern and central highlands, who prefer to sell at Kariakoo. The reasons for this preference for Kariakoo has been discussed in detail earlier.

The busiest period for the market extends from May through to October. The market, however, is particularly vulnerable to heavy or extended rainy seasons, as its main supply artery, the Kilwa Road, is well-known to be unable to withstand heavy rains without becoming impassable.

7 *Pakacha* is a small basket formed by weaving the strands of two palm leaves together.

According to the Market Secretary the market is expanding all the time, and the removal of refuse from the market site is becoming a problem as the market becomes increasingly congested. He particularly made reference to the lack of tools and equipment for this job, specifically mentioning the problem of not having access to a truck for clearing cesspits.

Ubungo Market

Ubungo Market is situated on the junction of Morogoro Road and what is now called Nelson Mandela Road [8]. It is located near to the main city council weighbridge and at the terminus of several urban bus routes. Its location as the first main market place on the Morogoro Road on entering the city puts it in an advantageous position to receive informal deliveries of wholesale foods from central and northern Tanzania. The Nelson Mandela Road is where lorries heading for the port turn off to avoid the city centre, and as there is only one other smaller market place on the way to the port area, lorry drivers who have food to sell frequently stop at Ubungo.

The retailers at Ubungo pay for a licence and a rent on their stalls, as described in the other market places. There was at one time a partnership between the traders in the market. However, this has since collapsed. The traders' descriptions of this partnership and the circumstances of its collapse are vague, although it was described by some as a cooperative. The traders now pay a small contribution towards security (again in the from of militia guards), refuse collection and some other services. It was reported that there were 120 traders on the Market Secretary's records, all of whom were retailers. According to the Market Secretary, there were no wholesalers operating at Ubungo: "wholesalers are those with a special clearance, in the form of a licence, from Kariakoo Market." The evidence obtained in the form of reports from other market secretaries as well as consumers who purchase from the market contradict the Market Secretary's account, suggesting that the market is a good source of bananas, both retail and wholesale.

Although Kariakoo is the most important source of fruit and vegetables, Tandale is of secondary importance. The retailers buy maize, rice, tomatoes, cabbages, mangoes, fish, sugarcane, onions, potatoes, yams, Irish potatoes, bananas, carrots, egg plants and some *mchicha* from both Kariakoo and Tandale. Occasionally supplies are brought directly from producing areas such as Morogoro, Mbeya, Iringa: bananas, potatoes, oranges, millet, fish, cabbages, beans, rice, maize, groundnuts, cassava, and peas may be acquired in this way. *Mchicha* is typically bought from producers in the nearby area and brought to the market by the retailers, or, alternatively, it may be brought to the market by producers themselves, some of whom also sell it direct to consumers. Some traders in the market have what they described as "long term trading bonds" with wholesalers, where they agree to purchase their goods from the same supplier. In return they may receive preferential rates. However, in practice, these

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8 Nelson Mandela Road was named after the South African political leader, when he visited the city after he was freed from prison. The road was known as the Port Access Road at the time of the survey.

agreements are not formal and depend on the availability of the commodity the retailer is looking for. Cliffe *et al* (1975) described circumstances in Lushoto where some producers would send supplies of fruit and vegetables to relatives in the either Tanga town or in Dar es Salaam, rather than selling it to traders or transporting it into the city to sell to retailers they do not know. This has the advantage of both the retailer and the supplier knowing and trusting each other and cutting out the handling between the producer and retailer, which would inevitably result in increased margins for each. However, they also described such kin-related transactions as rarely occurring regularly and not always involving immediate cash repayments.

Food supplies to Ubungo market can be badly affected during the rainy season, from March to May, when produce does not arrive in the city, being held up by flooding or impassable roads. On the other hand, oranges, fish, maize and beans have annual peak seasons of supply, occasionally causing a glut.

The traders use a five tonne lorry for transporting some produce to the market. Consumers buying in bulk often hire *mikokoteni* (a hand-pushed cart) to transport their purchases home, but not usually for distances of over $1^1/_2$ miles. *Mkokoteni* (plural: *mikokoteni*) is a relatively inexpensive method of transporting a limited amount of produce over a short distance, and is generally used by traders close to their source (Sporrek, 1985). For example, *mkokoteni* are regularly seen operating from Kariakoo to Kisutu Market, a distance of approximately 1 km, or ten minutes. At the time of the survey, this journey would have cost approximately of TShs 100, although this, as in the case of almost all informal transportation in Tanzania, is negotiable, depending on the size and value of the load, distance and the negotiating skills of those striking the deal. From Kariakoo, distances further than Kisutu are likely to be considered too far, or a considerably larger price is demanded. If their purchases are too large or the distance is too far for *mikokoteni*, the wholesale buyer may hire a pick-up either alone or together with someone else.

Kinondoni Market

Kinondoni market represents the top end of the market in terms of quality. It is known around the city of Dar es Salaam as the 'TX Market', because it caters for the tastes of the expatriate community, whose vehicles generally have registration numbers beginning with the letters 'TX'. The Market officials and retailers proved considerably less cooperative than in the other markets. It proved impossible to obtain an interview with any market officials in the time available, and as a result their cooperation in the survey of the traders did not go beyond granting permission. Much less qualitative information, therefore, was obtained about this market.

The market is not large, with about 60 retailers. The quality of the produce is far superior to that on display in the other markets visited, but the prices are also higher. The retailers explained that they purchase the freshest possible fruit and vegetables, discarding any of poor quality

and this increases their costs. They also have to discard any produce which begins to lose its freshness and this must be added to the cost of purchase. Their customers come from the area around Msasani peninsula and Oyster Bay, which is where the relatively affluent expatriates, diplomats and aid workers tend to live. They can generally afford the prices being asked for at this market.

Ilala Market

Unlike the other markets, Ilala was at one time an official wholesale market for the city. This was whilst the old Kariakoo building was being replaced by the Kariakoo Market Complex. This may have had the effect of establishing Ilala as a good area for the purchase of some fruit and vegetables. Ilala has about 120 retailers, a large proportion of whom are able to occupy a concrete stall under the shelter of the Ilala Market building erected by the City Council. As in the other markets, Ilala retailers pay an annual fee for a trading licence and a monthly stall rent.

Ilala is not located on any of the main routes into the city, and so benefits less from the delivery of produce arriving in Dar es Salaam through informal marketing channels. It is located in the centre of a relatively old part of the city, which has traditionally housed the flood of immigrants from the rural areas arriving in search of employment in colonial Dar es Salaam. It is the closest of the survey markets to the wholesale market at Kariakoo. Consequently the retailers are reported to rely heavily on Kariakoo for the purchase of their produce. Ilala is close enough to Kariakoo to enable its retailers to use *mikokoteni* for transporting produce. The market has the additional retailing attraction of having large numbers of traders selling non-food items such as cooking implements, clothes and so on, in the open air around the main market building.

Chapter Four
Kariakoo Wholesale Market

4.1 Introduction

This chapter presents the analysis of the daily, monthly and annual variations in volume, value and price of the sixteen most important fruit and vegetable commodities delivered to Kariakoo wholesale market. The data were taken from two sources. The daily data were sampled from the daily reports compiled by the Kariakoo Market Corporation statistical officer from the tally sheets completed daily by each of the tally clerks, who check in any deliveries to the market. The monthly and annual data were taken from the monthly reports compiled by the statistical officer from the daily reports. The data were then analysed using both a spreadsheet (Microsoft Excel) and a mainframe statistical application ($SPSS^X$) in order to calculate the means and the deflated values and prices and to produce the statistical results.

The chapter is structured as follows: Section 4.2 deals with the annual volumes of wholesale deliveries to Kariakoo. Section 4.3 examines the monthly volume data, comparing the absolute and proportionate volumes of the various groups of commodities. The daily volumes of deliveries are analysed in Section 4.4. Section 4.5 examines the annual variations in the real value and price per metric tonne of fruit and vegetables at Kariakoo. The monthly variations in real price and values are examined in Section 4.6. Finally, the results of the analysis in this chapter are summarised in Section 4.7, concluding with a brief assessment of Kariakoo's major problems and future prospects.

4.2 Annual Wholesale Market Deliveries

Data concerning the delivery of sixteen fruit and vegetable commodities to Kariakoo Wholesale Market (KMC) were collected on a monthly basis from January 1981 to August 1989 (the latter month having the last available data at the conclusion of the field visit). The sixteen commodities used for this survey were included in the KMC wholesale market records along with peaches, pears, four types of cooking bananas and several types of dried fish. The sixteen commodities were selected by eliminating the others for various reasons; fish were not relevant to the study; peaches and pears are supplied in very small quantities, are highly seasonal and the nature of the data makes it difficult to obtain useful results; cooking bananas are a staple typically cooked on their own (whereas Irish potatoes are included because in Dar es Salaam they are typically included in cooked stews in the same way as one might include other cooking vegetables). The data are compiled at the end of each month by the KMC statistical officer from the month's daily record sheets. The annual records are then compiled each year from the monthly record sheets (Appendix 4.1).

Figure 4.1 Percentage Profile of Mean Annual Deliveries of Fruit and Vegetables to Kariakoo by Weight, 1981-88

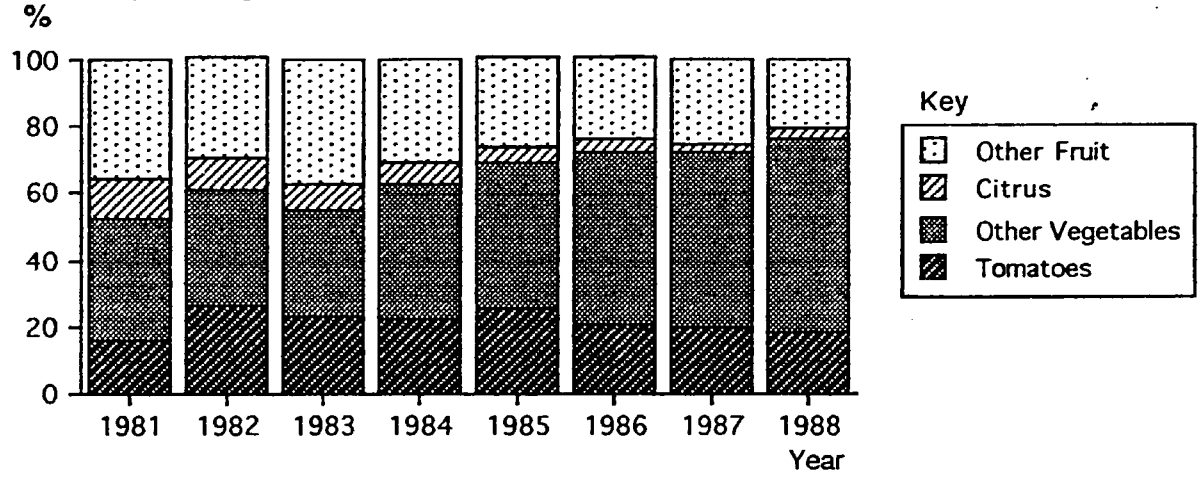
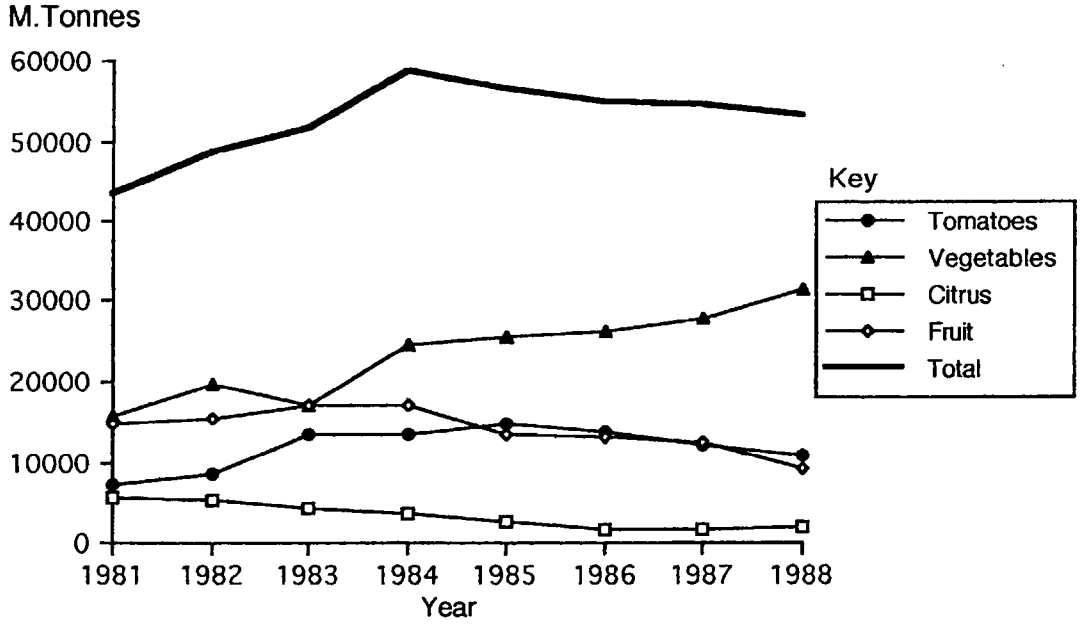


Figure 4.1 summarises the data, presenting the annual deliveries for groups of commodities. A number of patterns can be seen. After a period of little change from 1982 to 1985, of between 22 and 26 per cent, the proportion of tomato deliveries consistently decreases to 18 per cent in 1988. In absolute terms, as shown in Figure 4.2, tomato annual deliveries climb from 7,584 tonnes in 1981 to a peak of 14,859 tonnes in 1985, before declining steadily to 10,680 tonnes in 1988. This nevertheless constitutes a net increase of 40.8 per cent over the period 1981-88.

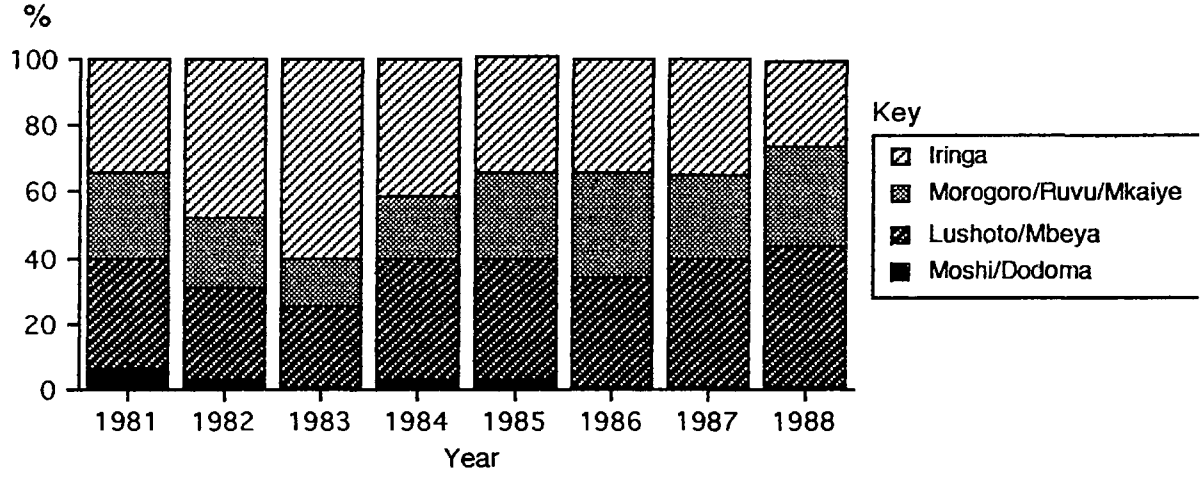
Figure 4.2 Annual Volume of the Main Fruit and Vegetable Groups Delivered at Kariakoo 1981 to 1988



According to Hemy (1961), most Tanzanian soils will support tomatoes if they are well drained and have a long, warm growing season. As the urban population has found its income increasingly inadequate to meet basic needs, alternative strategies for survival have been sought. One such strategy is to obtain food from 'informal' sources, the most common of which is to grow food on small personal plots, where possible, within and just outside the city. This

diversion into cultivation can also supplement a resident's income if (s)he sells that produce not required in the home to friends, neighbours or work colleagues. In addition to this trend among the consumers, market traders have begun to seek their commodities from alternative, cheaper sources. This may mean purchasing 'informally' from people who have transported commodities as far as a retail market and are selling them wholesale there. For example, traders named markets such as Ubungo, Tandale, Tandika and Buguruni as good sources for certain types of produce for retailers. Traders in Mwenge were even reported to be going to Kunduchi, an area just north of Dar es Salaam, at certain times of the year, particularly during August, to buy tomatoes direct from producers there. It is clear, therefore, that the decline in tomato deliveries at KMC does not necessarily mean that there has been a decline in the supply to the city, just that alternative channels may now be increasingly used. These issues will be looked at in more detail in Chapter Five.

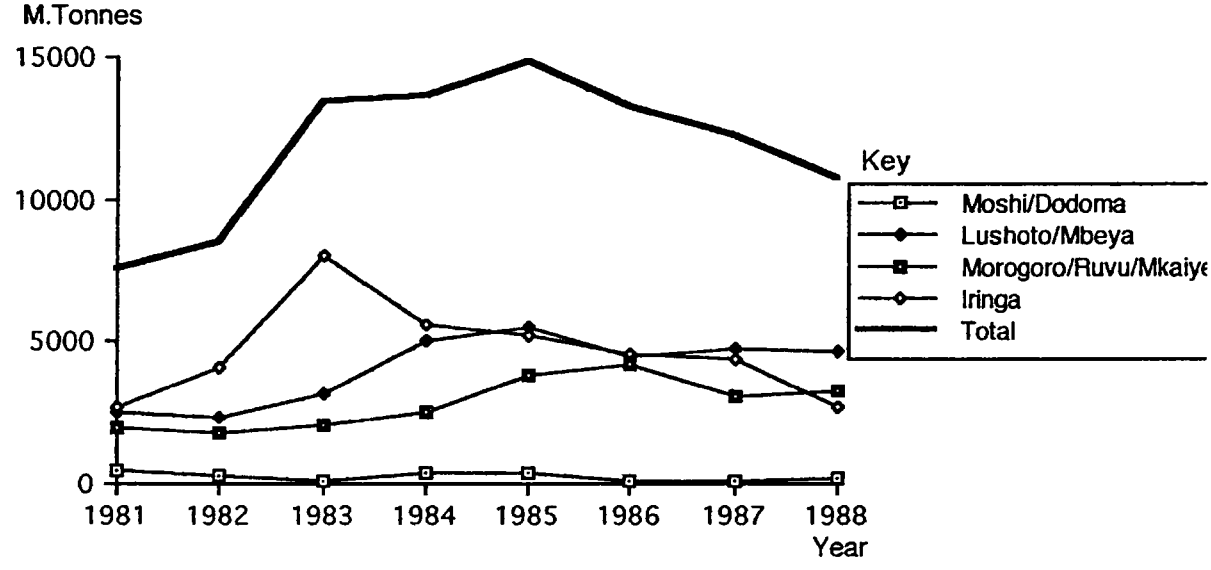
Figure 4.3 Proportion of Tomato Deliveries to KMC from Different Origins



A closer look at the origins of tomato deliveries (Figure 4.3) shows that the relative positions of the origin groups have varied over the 1981-88 period. The data for tomato deliveries are divided by the KMC into four categories: tomatoes from Moshi and Dodoma; tomatoes from Lushoto and Mbeya; tomatoes from Morogoro, Ruvu and Mkaiye; and finally from Iringa. According to the employees of KMC, these four groups roughly coincide with the four main varieties arriving at Kariakoo. They are clearly not divided up by geographical criteria, since the origins that are grouped together are not proximate (see Figure 2.1). There appears to be little consistency throughout the period. The Moshi/Dodoma group never reaches more than the 6 per cent of total deliveries (achieved in 1981) and declines to a total annual delivery of 151 tonnes, or 1 per cent in 1988, a net decline of 8 per cent per annum. Iringa tomatoes have also declined steadily since the very large delivery of 8,030 tonnes in 1983, a 67 per cent increase from 1981. This group then declined by an average of 13.3 per cent per annum during the period from 1983 to 1988. The Lushoto/Mbeya category declines in proportion over the first three years from 34 to 24 per cent, but in 1984, it accounts for 37 per cent, a figure maintained in

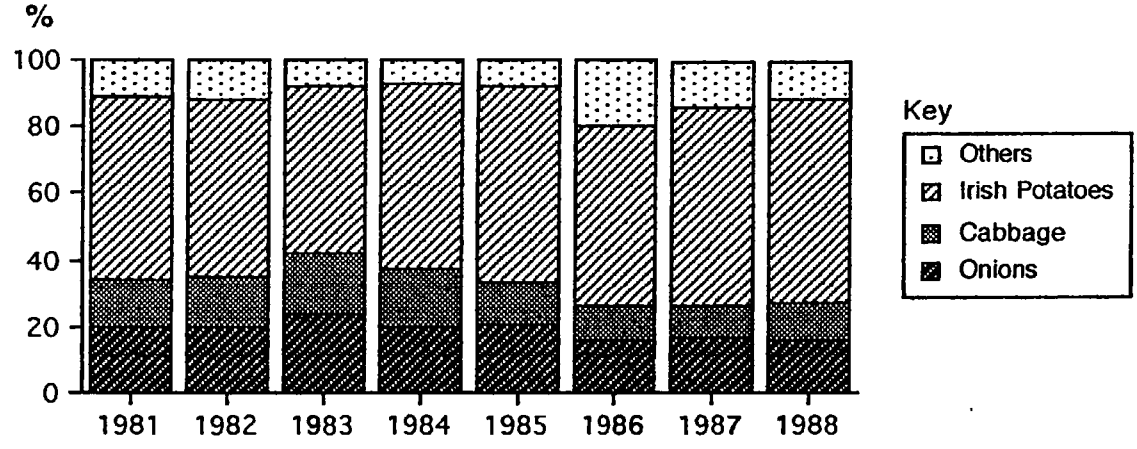
1985, as the three major categories approach roughly an equal share of overall tomato supply. From 1986 to 1988, tomatoes from Lushoto and Mbeya continued to rise in relative importance, as the the two other main origin groups declined, particularly Iringa. The Lushoto/Mbeya tomato deliveries rose to account for 43 per cent of the deliveries by 1988, while the other two groups declined to 30 per cent for tomatoes from Morogoro, Ruvu and Mkaiye, and 25 per cent for tomatoes from Iringa. The pattern of the deliveries is illustrated in the graph in Figure 4.4.

Figure 4.4 Annual Volume of Tomato Deliveries to Kariakoo Market by Origin



Vegetables (which include onions, cabbage, and Irish potatoes), after a small decline in 1983, show a steady net relative increase from 36 per cent of all fruit and vegetable deliveries in 1981, to 58 per cent in 1988. This is very much reflected in absolute terms by a rise from 17,217 tonnes to 34,847 tonnes or a net annual increase of 12.7 per cent.

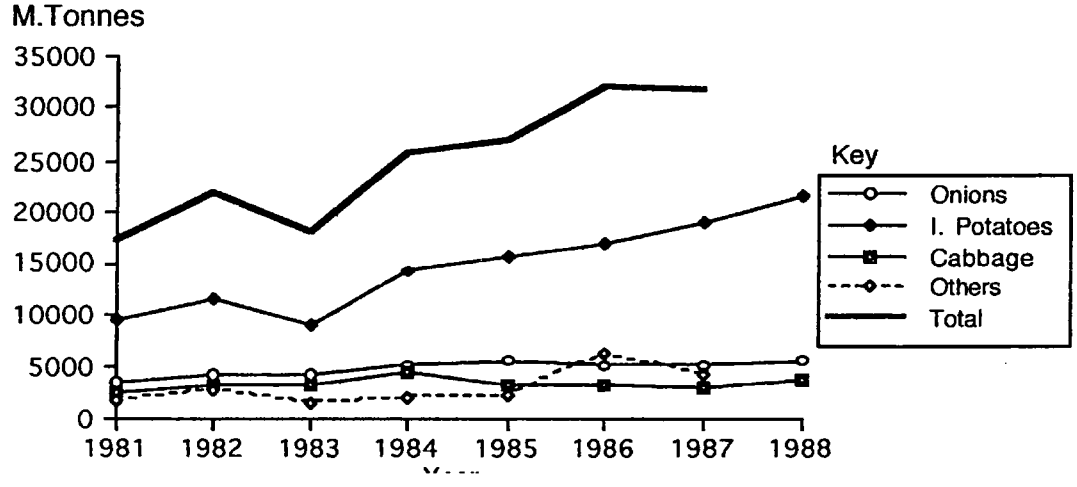
Figure 4.5 Percentage of Deliveries to KMC of Selected Vegetables, 1981-88



Inspection of Figures 4.5 and 4.6, shows that a significant amount of the change in proportions can be accounted for by the increase in Irish potatoes and the 'other' category. Irish potatoes increased steadily from 9,498 tonnes in 1981 to 21,378 tonnes in 1988, a net increase of 15.6 per cent per annum. The 'other' category (including peas, lettuce, carrots and beans) increased

rather less, from 2,508 tonnes in 1983, peaking in 1986 at 6,324 (accounting for 25 per cent of fruit and vegetables), to 3,980 tonnes in 1988, or a net increase of 15.0 per cent per annum. This increase in the delivery of Irish potatoes and other vegetables may be the result of household survival strategies, mentioned earlier, as a result of the deepening crisis in economic and business confidence. In this case, Kariakoo has the facilities to handle bulk commodities, such as Irish Potatoes, and so the Dar es Salaam population, looking for a cheap bulk vegetable as an alternative to the traditional vegetables and staples, turned to potatoes in preference to traditionally favoured ones. Traditional vegetables became relatively more expensive, thus reducing the price difference between them and alternatives. As a consequence, deliveries of potatoes and alternative vegetables increased rapidly to meet this demand, and because Kariakoo has the facilities to suit, and a known pool of buyers, it has benefited from this increase in supply.

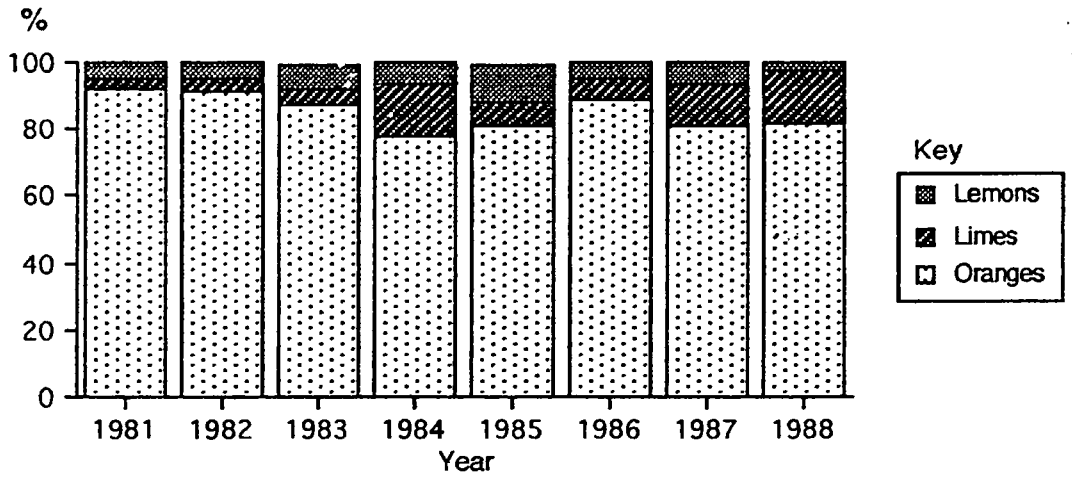
Figure 4.6 Annual Volume of Vegetable Deliveries to Kariakoo Market, 1981-88



Note: The data for the 'other' vegetables was missing in 1988.

During the period surveyed, a third clear pattern to emerge is that of the steady decline in the proportion of deliveries of citrus fruit (oranges, limes and lemons) (Figure 4.1). The bulk of the citrus fruit group is accounted for by oranges which, nevertheless, declined from 5,007 tonnes in 1981 to 1,403 tonnes in 1987, followed by a slight increase in 1988 to 1,440 tonnes (Table 4.1). This is a net decrease by the end of the period of 8.9 per cent per annum. The decline in lemon supply to Kariakoo is, to some extent, very similar, although there is a temporary increase from 248 to 323 tonnes between 1981 and 1983. The net decline at the end of the period to only 35 tonnes in 1988 demonstrates a reduction of 86 per cent, or 10.7 per cent per annum.

Figure 4.7 Percentage Deliveries of Selected Citrus Fruits, 1981-88



According to Mascarenhas and Mbilinyi (1971), in the 1968/69 season Dar es Salaam's main source of oranges was the Kisarawe District of Coast Region, about 40 km from Dar es Salaam. They made reference to the potential of Muheza District (Tanga Region), just over 300 km north of the city, and Morogoro District about 200 km inland. According to the Marketing Development Bureau (1986), these latter two now provide the dominant supply of oranges to the Dar es Salaam market. This was confirmed by interviews with the Kariakoo and retail market officials, although they did also mention the rising importance of Kilwa District, located about 300 km south of Dar es Salaam on the coast. The main road from the south, Kilwa Road, passes near to Tandika market. The main road from the north meets the Morogoro Road at Chalinze, just over 100 km inland of the city, and as it enters Dar es Salaam, Morogoro Road passes close to Ubungo, Manzese and Tandale markets, before reaching Kariakoo in the centre of the city. Interviews with market officials and traders revealed that oranges from Kilwa are frequently sold wholesale at Tandika, whilst oranges from Tanga and Morogoro are often sold wholesale at Tandale. Oranges from all three sources are reportedly sold at Kariakoo and occasionally Kilwa oranges turn up at Tandale. Buguruni, on the Port Access Road (recently renamed Nelson Mandela Avenue), is also reported to be an important wholesale source of oranges, although it is not clear where these oranges originate (see map in Figure 3.1).

Table 4.1 Annual Citrus Fruit Deliveries and Mean Annual Change, 1981-88 (Metric Tonnes)

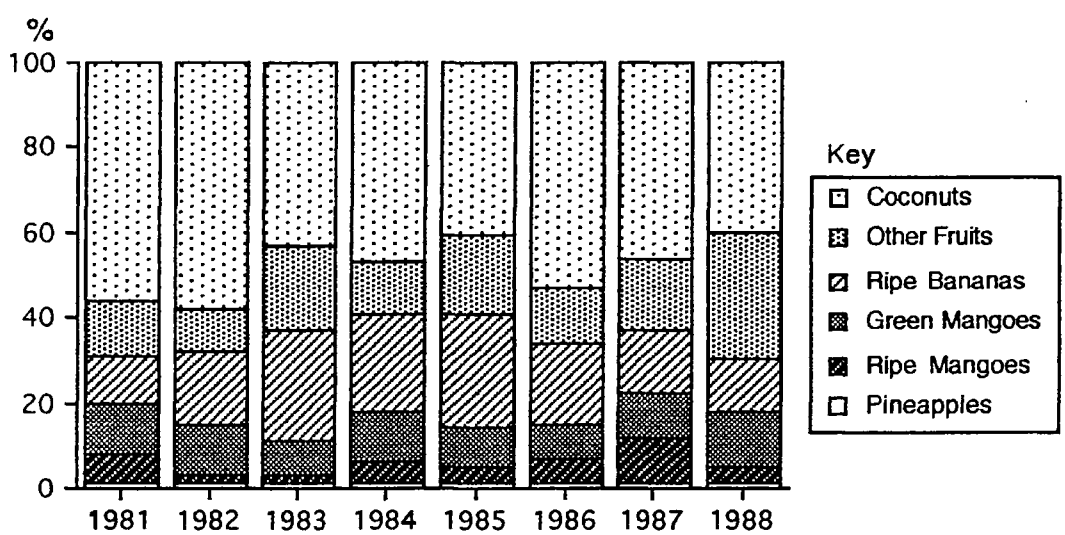
Fruit	1981	1982	1983	1984	1985	1986	1987	1988	Annual Change
Oranges	5007	4822	3863	2780	2229	1526	1403	1440	-8.9% p.a.
Limes	190	210	231	555	197	101	219	273	+5.4% p.a.
Lemons	248	292	323	243	309	80	114	35	-10.7% p.a.
Total	5445	5324	4417	3578	2735	1707	1736	1748	-8.5% p.a.
Proportion of Total Delivery	12	10	8	6	5	3	3	3	

Source: Kariakoo Market Corporation Records, 1981-88

Tandale is considered important enough in orange wholesaling for the KMC to send officials to act on its behalf as commission levying agents, who attempt to collect commission on the produce dealt with there. However, as the KMC provide no facilities for wholesaling at Tandale, their staff are in a relatively weak bargaining position and they admit they often have to accept from traders what they can get from negotiation. It seems that an elaborate wholesale network has emerged for the distribution of oranges, among other perishables, which is able to adapt to the changing circumstances, as sources of produce come into and go out of their harvesting season. It appears that liberalisation of the markets for previously controlled foods may have encouraged traders in fruits to be more open about trading their oranges. At the same time, because of the congestion and unsuitable, highly centralised chains of distribution in operation at Kariakoo, wholesaling there became much less attractive.

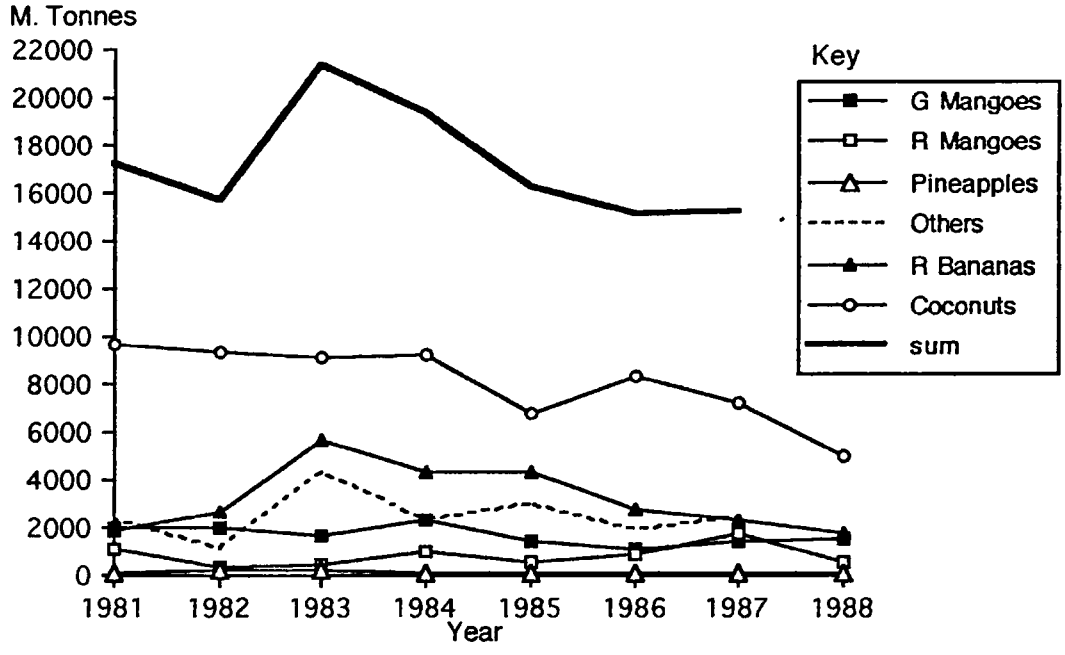
In contrast to the other citrus fruits, limes have expanded their proportion of the total delivery of citrus to Kariakoo twice during the period, to 16 per cent (in 1984 and again in 1988), with a lapse between of four years (Figure 4.7). The explanation lies in the fact that limes are not eaten in the same way as fruit such as oranges, but are used to accompany foods, such as fish or salads, as a garnish or flavouring. This results in a linking of limes to the vegetable markets, where they may be bought along with the vegetables with which they will be consumed.

Figure 4.8 Percentage Deliveries of Selected Fruits, 1981-88



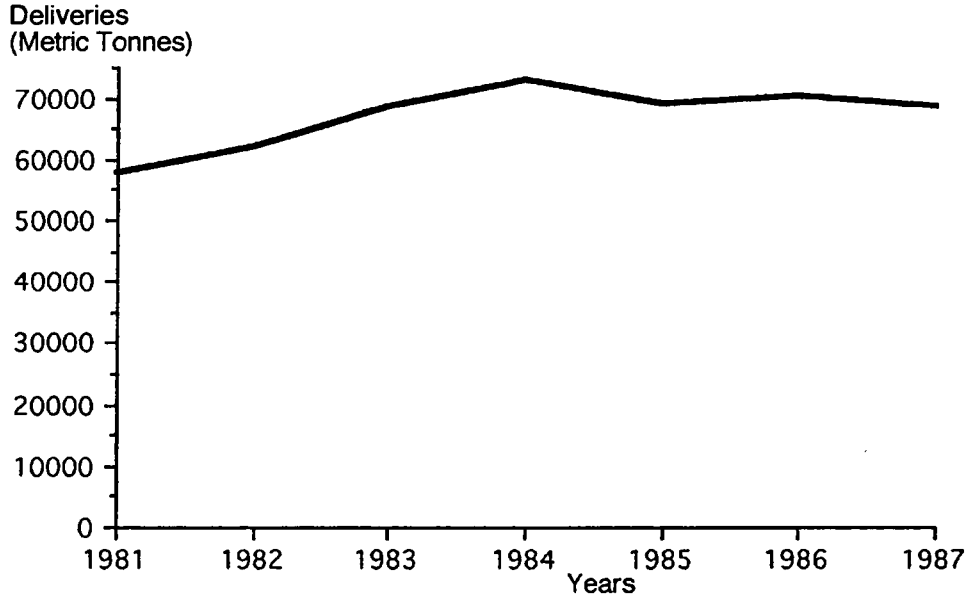
'Other' fruit, like citrus, tends to be retailed from either official retail markets, or at small, less official stalls, or even from bags at the side of the road. They tend to be highly perishable and therefore have to be distributed to the retailer for sale as quickly as possible. The 'other' fruit category has experienced a net increase from 7,344 tonnes in 1981 to 7,493 in 1988, an increase of 2 per cent. However, the proportion of the total fruit and vegetable deliveries this category represents has decreased over the period from 36 per cent to 21 per cent (see Figure 4.1).

Figure 4.9 Annual Volume of Fruit Deliveries to Kariakoo Market



In terms of the proportion of annual deliveries, the bulkier and less perishable vegetables have increased at the expense of the more perishable tomatoes (after an initial rise in 1982), citrus fruits and 'other' fruits. It is, however, clear that tomatoes and fruits are being obtained elsewhere,other than Kariakoo by both retailers and consumers. This will be explored further in Chapter 5, which examines Dar es Salaam retailers and their sources of fruit and vegetables.

Figure 4.10 Total Fruit and Vegetable Deliveries to Kariakoo Market 1981-87



In summary, Kariakoo's volume of trade reached a maximum capacity of around 70,000 metric tonnes per annum in 1983 (Figure 4.10). Despite this relatively stable overall supply changes in the relative balance of individual and groups of commodities have occurred. Most vegetables have continued to increase in relative importance during this period, while fruit and citrus crops have declined.

With the increasing population in Dar es Salaam Region (the annual intercensal population growth rate between 1978 and 1988 was 4.8 per cent), it can be assumed that the demand for fruits and vegetables wold have increased concurrently. It must, therefore, be concluded that the wholesale market, as the relative importance of vegetables over this period has increased, is being avoided by fruit sellers. To some extent, this was confirmed by informants in various surveyed retail markets, who tended to buy fruit from markets such as Tandale, Tandika and Ubungo (see Figure 3.1). This information will be examined in more detail later. In addition , farmers who transport their own goods into Dar es Salaam, and traders interviewed in the two key vegetable producing areas, reported Kariakoo as being the main market they would consider. It has unloading facilities as well as a known pool of registered buyers, whereas in other markets the buyers are unknown to them and the facilities for unloading are not as good. The number of Kariakoo dealers is limited by KMC licensing arrangements. It is likely that farmers and up-country traders coming to Dar es Salaam easily identify a trader with whom they are happy dealing and return to him in future harvesting seasons. In the informal sector, however, this kind of trust is more difficult to establish. There are greater risks, both from having to deal with someone unknown and the technical illegality of informal sector wholesale dealing generally. Only when the trader knows a wholesale buyer in the informal sector, or the price offered is sufficient to outweigh the risks, would the informal sector seem to be attractive method of disposing of produce. The margin achieved by avoiding the Kariakoo sales commission and licensing charges and the costs of porterage around the market, make the attraction of the informal sector more likely.

4.3 Monthly Volumes

In order to assess monthly variations in deliveries of the different commodities at Kariakoo wholesale market, the monthly mean delivery was calculated for each commodity over the time period 1981-89 (see Appendix 4.2). It should be noted that the months January to August used data from 1981 to 1989, whereas for months September to December only data up to 1988 were available.

Figure 4.11 shows that the mean monthly delivery by weight of all fruit and vegetables is 4,304 tonnes, with a range from 4,017 to 4,656 tonnes. This demonstrates a remarkable consistency of delivery throughout the year, with a coefficient of variation of 4.47 per cent. The peak months are July, with the highest estimate of monthly mean deliveries of 4,656 tonnes, and October with 4,597 tonnes. When the proportional group delivery profile in Figure 4.12 is examined, a

relatively stable pattern is found for each of the groups. During the first month of the year the fruit and vegetable groups are delivered in the following proportions: tomatoes accounted for 23 per cent of the mean monthly deliveries, vegetables account for 45 per cent, citrus for 4 per cent and fruit account for 27 per cent. On the whole, throughout the year these proportions are maintained by each of the groups. Tomatoes range from a low of 19 per cent in August, with a mean delivery of 854 metric tonnes, to a high of 27 per cent in November, consisting of a mean delivery of 1,192 metric tonnes, although for much of the year tomatoes account for around 20 per cent of overall deliveries. Vegetables range from a low proportion of 39 per cent in November, made up of the lowest mean delivery of 1,731 metric tonnes, to a high of 52 per cent, made up of the third highest mean monthly delivery of 2,116 metric tonnes in April, at the height of the long rainy season. Citrus fruits play a surprisingly small role in the make-up of the fruit and vegetable delivery at Kariakoo, accounting for a proportion of mean monthly deliveries ranging from 2.5 per cent in February, the lowest mean delivery at 100 metric tonnes, to a high of 9.4 per cent in August, the peak of mean monthly deliveries at 422 metric tonnes. This large range demonstrates the highly seasonal nature of the citrus fruits, in contrast to the vegetables, many of which can be produced throughout the year, given the appropriate conditions and husbanding techniques. The seasonality of many of the other fruits is reduced in the overall mean monthly fruit deliveries by the year round harvesting of fruits such as coconuts and ripe bananas. The fruits range from 22 per cent in May, at the end of the long rains to 30 per cent in August at the end of the long cool dry season and 29 per cent in November at the end of the short rains. The reason for these variations within each group will now be examined in more detail.

Figure 4.11 Mean Monthly Volume of Delivery of the Main Fruit and Vegetable Groups at Kariakoo 1981 to 1988

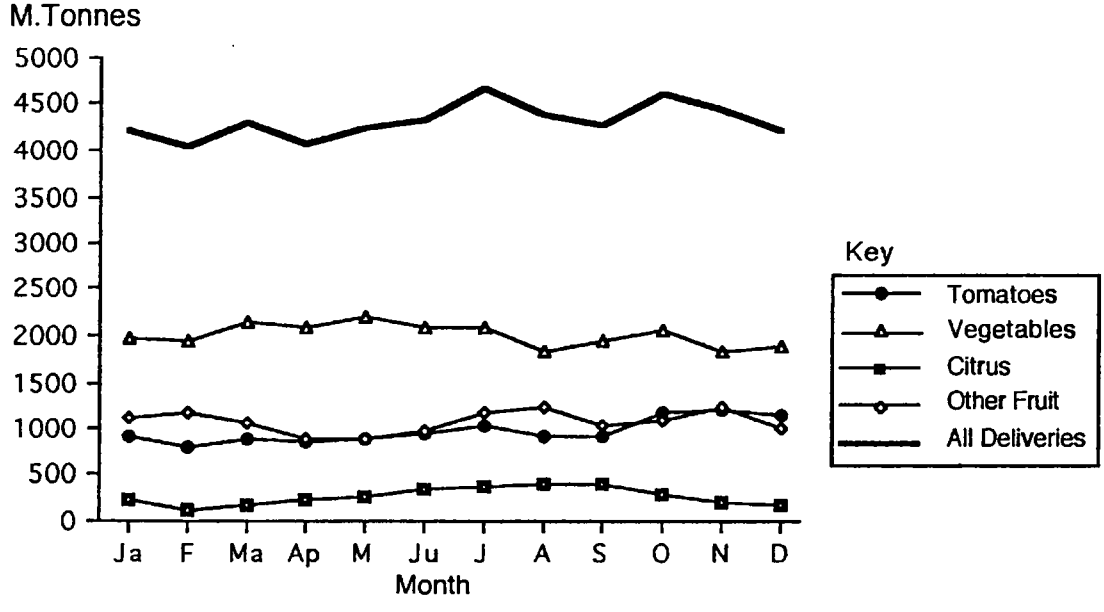
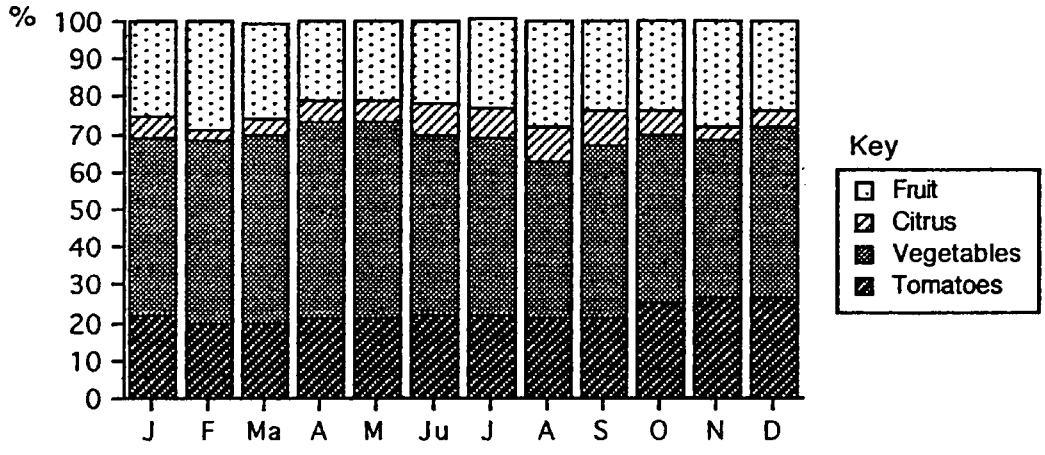
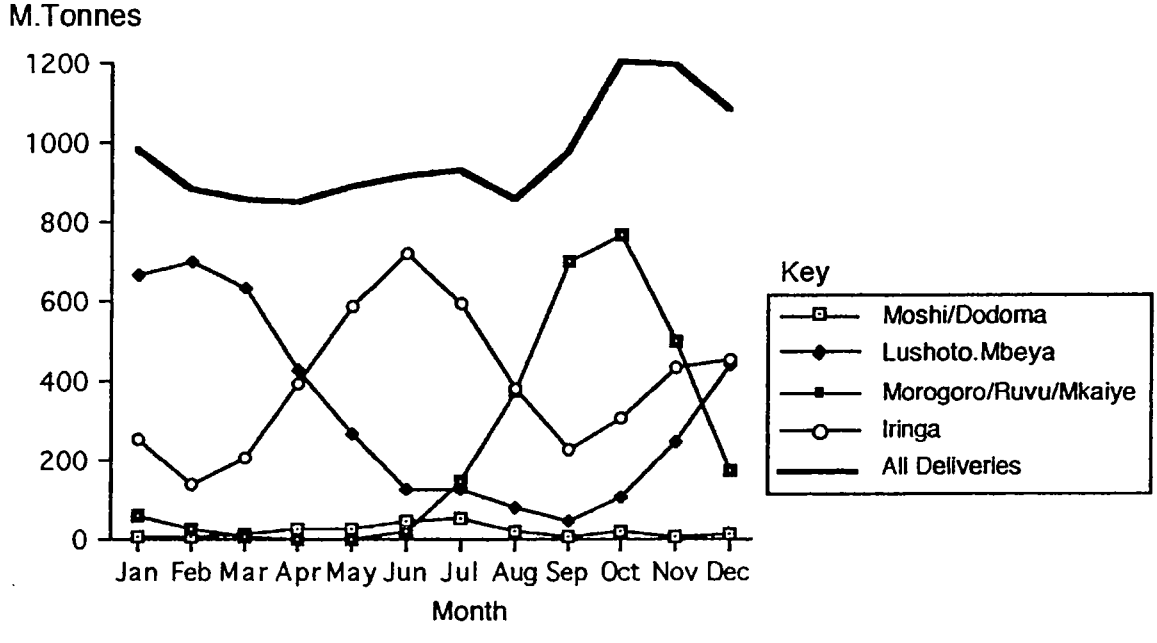


Figure 4.12 Percentage Mean Monthly Deliveries of Fruit and Vegetables to Kariakoo 1981 to 1988



Mean monthly deliveries of tomatoesare shown in Figure 4.13. This shows an overall decline from 980 metric tonnes in January to 880 metric tonnes in February, to a low of 856 and 846 metric tonnes in March and April respectively. The reason for this low supply, according to interviews with producers and traders, is the influence of the long rainy season. The rains affect both the transportation, making some roads at least difficult, if not impassable, as well as the tomato crop itself. The tomato plant is susceptible to fungal infection and fruit damage if it is subjected to heavy rains. This can only be prevented by investment in fungicides and chemical protection of the tomatoes. Those in a position to make this initial investment are in a strong position to gain from the high prices offered at this low point in the tomato supply year.The rest of the year is characterised by a slow rise in overall tomato deliveries up to September and then a large increase in October to a mean of 1,203 metric tonnes, as the short rainy season begins. After this peak the supply of tomatoes declines slowly towards the end of the year.

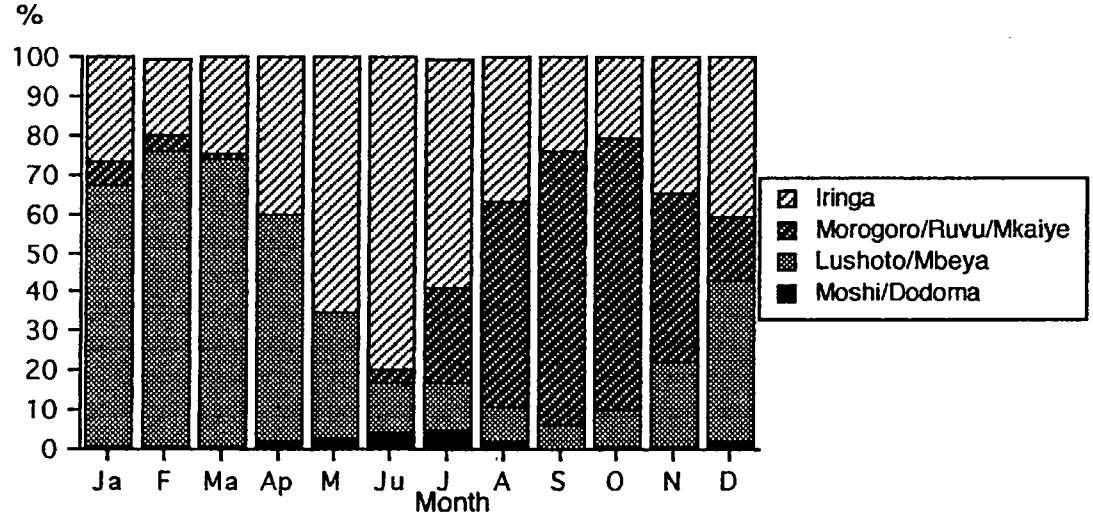
Figure 4.13 Mean Monthly Deliveries of Tomatoes to Kariakoo 1981-1988



The smallest tomato group recorded in the Kariakoo market record sheets is that from Moshi and Dodoma. The mean monthly delivery of this group never exceeds 55 metric tonnes. Indeed, during the entire period covered, deliveries from these areas do not exceed 184 metric tonnes, recorded in July 1981. In the first eight months of 1989, when this group should have reached its peak delivery, the largest monthly delivery was 9.9 metric tonnes in April. This extraordinarily low supply from this area may be explained by the poor rains in these regions in 1989. In addition, the longer term decline of these regions may be partly the result of the deteriorating condition of the roads connecting these areas with Dar es Salaam. This situation may change in the future, with improvements being made to the main road from Moshi to Dar es Salaam.

At the beginning of the year, the majority of tomatoes arriving at Kariakoo are from Lushoto and Mbeya. This group begins the year at a monthly mean of 664 metric tonnes and climbs to a peak of 703, before declining during the long rainy season to a mean monthly low of 83 metric tonnes later in the year in September. These tomatoes are delivered when the supplies from the other areas are at their lowest, hence supplies from Lushoto/Mbeya account for 80 per cent of tomatoes in February, the highest proportions of mean monthly supplies achieved. During the short rainy season, tomatoes from Lushoto and Mbeya account for 50 per cent of those tomatoes delivered, while tomatoes from Iringa account for another 46 per cent.

Figure 4.14 Percentage Profile of Mean Monthly Tomato Deliveries to Kariakoo

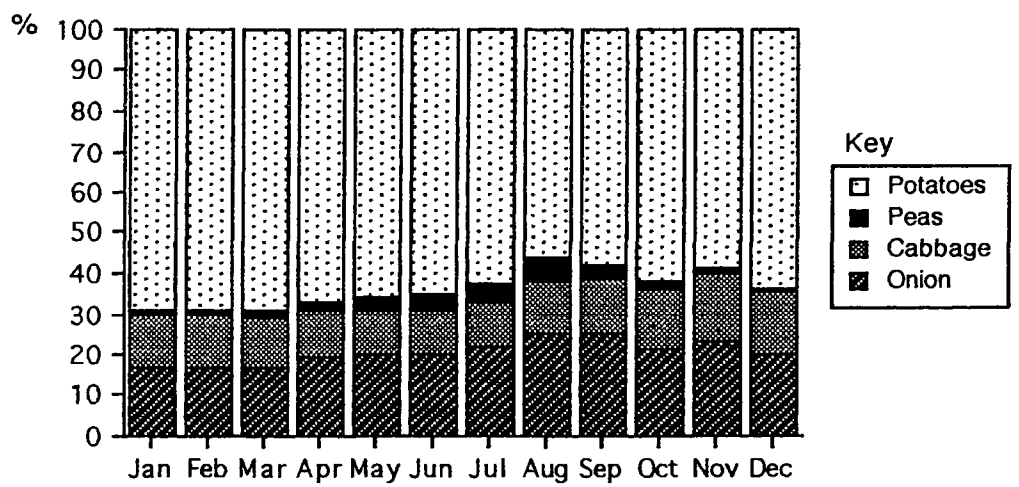


Tomatoes from Morogoro, Ruvu and Mkaiye begin the year by declining from 59 metric tonnes in January to the lowest mean monthly delivery of any of the tomato groups, at less than one metric tonne in May. However, from this low point the deliveries of tomatoes from these areas climb sharply to reach a mean of 769 tonnes in September, dropping sharply at the end of the year to 173 metric tonnes in December. This group of tomatoes are delivered in quantities when other regions such as Iringa, Lushoto and Mbeya are not delivering in large quantities.

Tomatoes from Iringa account for the largest proportion of tomato deliveries at Kariakoo, never declining below 16 per cent of mean monthly deliveries (in February), and accounting for as much as 79 per cent (June). The year begins with a decline from 251 metric tonnes in January to the smallest mean monthly volume of deliveries for this variety of 143 metric tonnes in February. The mean then begins a strong climb to the peak of the Iringa tomato delivery season during the long cooler dry season, in May to July, reaching a peak of 723 metric tonnes in June. Deliveries from Iringa reach a secondary peak of supply in December at the start of the short, hot dry season, when they return to 454 metric tonnes, accounting for 42 per cent of all tomato deliveries at that time. The supply of Iringa tomatoes is clearly important, with the supplies being maintained throughout the year.

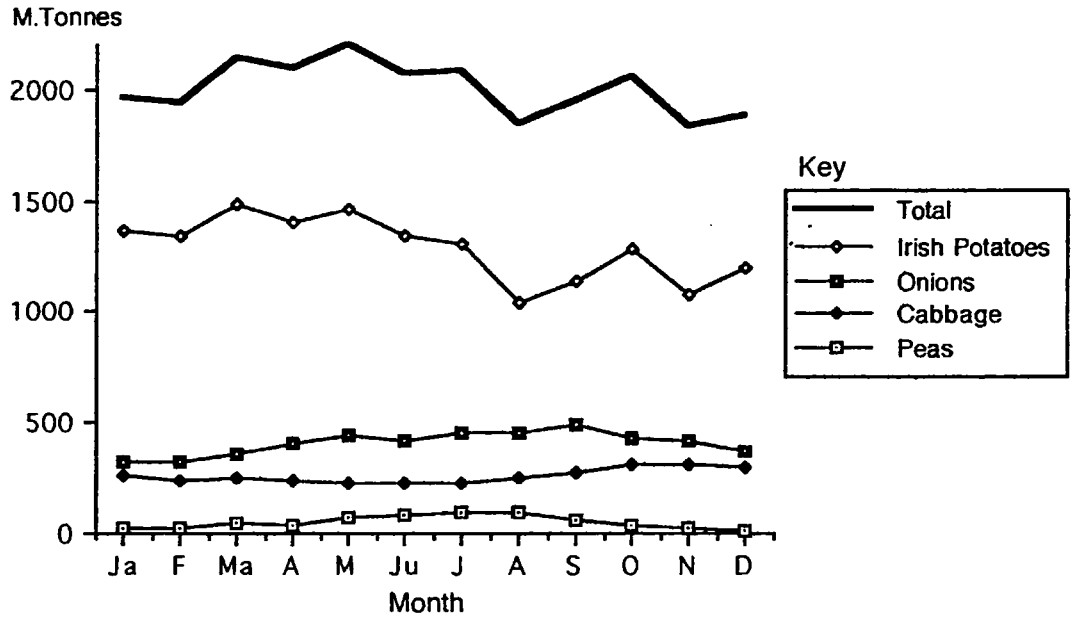
The relative importance of each tomato supply group is illustrated in Figure 4.14. This clearly demonstrates the times of year during which each of the three main supply groups dominates the Dar es Salaam market. The sum of mean monthly tomato deliveries ranges from 846 metric tonnes in April, during the long rains to 1,203 metric tonnes in October, during the short rains, a range of 30 per cent of the October delivery.

Figure 4.15 Percentage of Mean Monthly Vegetable Deliveries at Kariakoo



The variation in monthly vegetable deliveries appears to be far less than for tomatoes (Figure 4.15). The main trend is for Irish potatoes to decline in importance from a maximum proportion in January, February and March of 69 per cent to August, when they reach a low of 56 per cent. These commodities are not vying for dominance of the market in the same way as the tomato varieties appear to be and any variations which occur in supply from different regions of the country are likely to have a complementary effect on overall supply of any one commodity, in a similar pattern to that of the tomatoes. The variations are due to growing conditions and ease of transport from the supply areas. Because about two-thirds of vegetable deliveries are accounted for by Irish potatoes, the estimate of the total grouped supply follows roughly the same pattern. This effect is strengthened by the relatively gentle monthly supply variations apparent for the onions, cabbage and peas.

Figure 4.16 Mean Monthly Vegetable Deliveries to Kariakoo 1981 to 1988

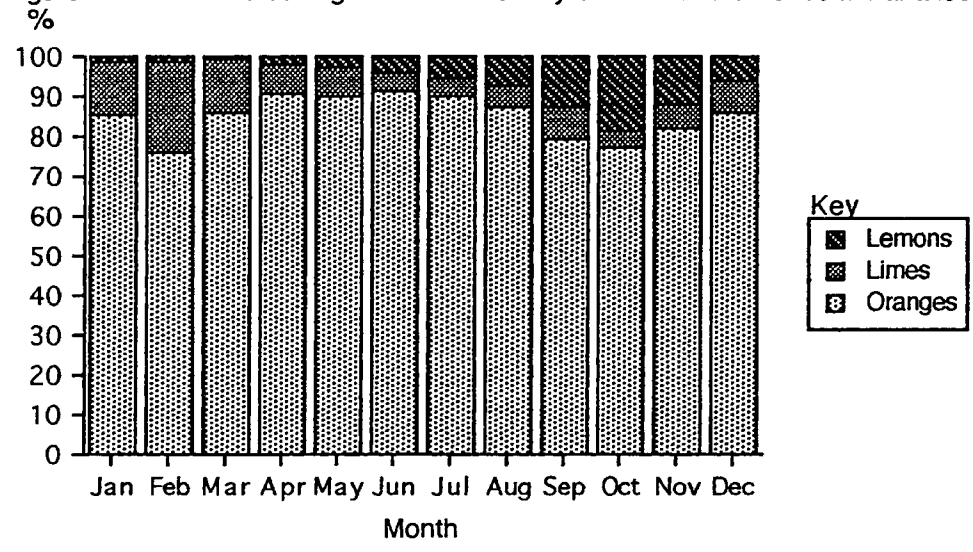


The relatively consistent proportions accounted for by each of the vegetables within the group is mirrored by the volumes of supply, presented in Figure 4.16. This graph demonstrates the importance of Irish potatoes to the overall supply pattern, as the sum of mean monthly vegetable deliveries follows the Irish potato mean monthly delivery very closely. This pattern of supply begins the year at 1,357 metric tonnes and climbs to the peak mean monthly volume of 1,466 metric tonnes in March. The rest of the year is characterised by a slow decline to 1,194 metric tonnes by December. The lowest mean monthly delivery occurs in August at 1,036 metric tonnes. Both onions and peas demonstrate a tendency to higher volumes of deliveries between March and August, of between 66 and 100 metric tonnes for peas and 441 and 487 metric tonnes for onions, while cabbage tends to be in greater supply later in the year, rising in supply from 270 metric tonnes in September to 309 metric tonnes in November, beginning to decline by December at a mean of 296 metric tonnes. This is a season of light rains for much of eastern Tanzania, coinciding with the main cabbage harvesting season. Those producers with access to irrigation can produce cabbage early, harvesting towards the end of the dry season in about August. However, the main harvesting of cabbages occurs towards the end of the rainy season when the cabbage can have abundant water during its two to three month growing period.

Clearly, on a monthly basis, there are continuous supplies of most vegetables throughout the year. Indeed, this consistency of supply throughout the year in all of the vegetable commodities is not repeated in any of the other commodity groups. Even in fruits, where at least a small delivery is made every month, there are significant variations in supply, whereas within the vegetable group, the monthly variations are relatively small. This is likely to be made possible by the fact that vegetables are planted on a seasonal basis and can often be timed to harvest at certain times, either to take advantage of the market, where sufficient capital is

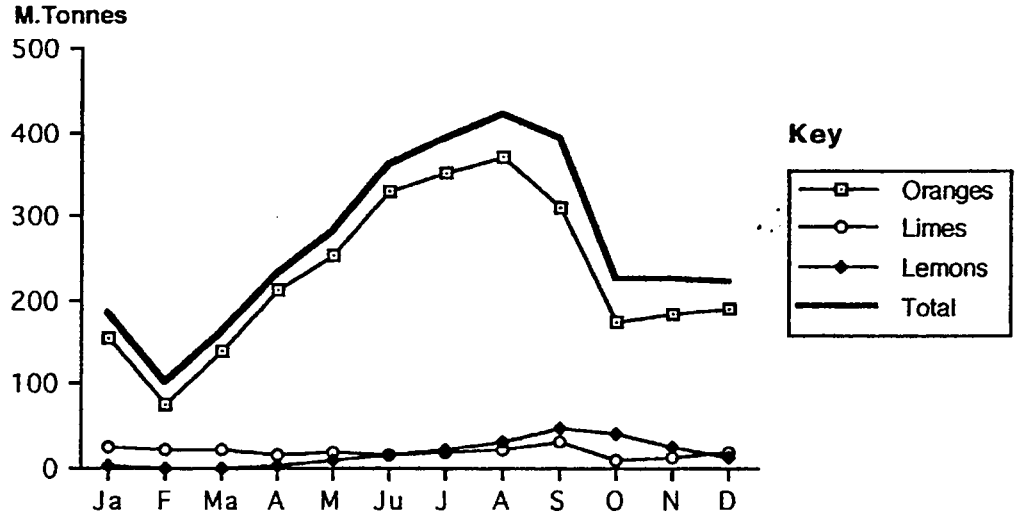
initially available to invest in the technology or techniques necessary, or, where it is not, to make full use of the environmental conditions, such as cool spells, dry seasons or rainy seasons. Fruits, on the other hand, are mainly perennials, with clear seasons for harvest. The reason there is some degree of consistency is the complementarity of different regions of Tanzania, where, due to the environmental circumstances, the perennials enter their harvesting seasons at slightly different times.

Figure 4.17 Percentage of Mean Monthly Citrus Fruit Deliveries at Kariakoo



The citrus fruit category's heavy dependence on oranges is clearly illustrated in Figure 4.17, where the lemon and lime deliveries are very low in comparison with those of oranges. The line of the sum of means follows closely the shape the orange supply has effectively given it. This pattern shows considerable similarity with the pattern described by Mascarenhas and Mbilinyi (1971). "The peak period, during which there was an upward trend in supply, extends for a duration of about three months; during the period, 1968-70, the rise in supply started in March and declined towards the end of June" (Mascarenhas and Mbilinyi 1971, p.4). They go on to report that between May 1968 and April 1969, the peak supply period was from March to July, when over 1,000 *matenga* (approximately 60 metric tonnes) were delivered each week, reaching a peak of almost 4,000 *matenga* (approximately 240 metric tonnes) in June. The off-season period from September to early March achieved approximately 100 *matenga* (approximately 6 metric tonnes) per week, with a small rise to about 1,000 *matenga* in one week in November. The mean monthly supply from 1981 to 1988 has a slightly modified pattern. The main season is from March to September, with a monthly mean peak peak in August of 5,822 *matenga* (approximately equivalent to 87 metric tonnes per week). The off season is not as low as described by Mascarenhas and Mbilinyi in 19868/69, with a low of 1,256 *matenga* in February (roughly equivalent to 18 metric tonnes per week).

Figure 4.18 Mean Monthly Citrus Fruit Deliveries to Kariakoo 1981 to 1988

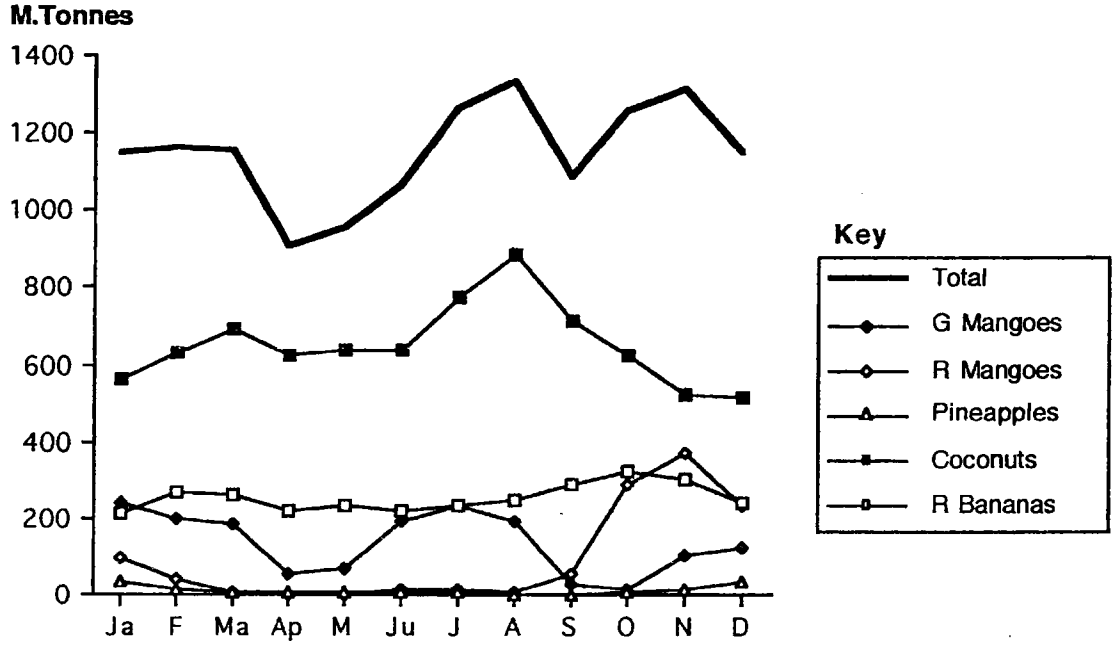


The modification in the main supply period for oranges is likely to have occurred as a result of the shift in emphasis from Kisarawe to the key orange producing regions of Tanga and Morogoro, and the emergence of areas close to the city, as discussed in the previous section. Although the orange supply varies between a mean of 76 metric tonnes in February and 370 metric tonnes in August (Figure 4.18), it maintains a stabler proportion of the citrus fruit deliveries only varying between 81 and 90 per cent (Figure 4.17). The reason for this is, firstly, the dominance of oranges in the citrus group. In addition, other citrus fruits are produced in the same areas as oranges and are harvested at about the same time. Lime deliveries, for example, peak at around the same time as the oranges rising from a low of 17 metric tonnes in the middle of the dry season to reach 33 metric tonnes in September, at the start of the short rainy season. However, in terms of the proportion of citrus, they are more important in February, accounting for 18 per cent of all citrus deliveries, when oranges and lemons are at their lowest. Limes appear to have a second harvesting season, reaching a mean monthly volume of 24 metric tonnes in January. Lemons climb from their off-peak months of February and March, when a mean of 1 metric tonne of lemons was delivered in each month, to reach its peak harvest time, just after oranges, in September, at 49 metric tonnes, accounting for 13 per cent of citrus fruit deliveries.

The shape of the 'other' fruit means has three peaks, in February, August and November (Figure 4.19). The first of these peaks in mean fruit deliveries at Kariakoo covers the first three months of the year. These are characterised by relatively high deliveries of green mangoes, which are in one of their two peak harvesting seasons of the year. Ripe mangoes decline from their peak at the start of the year, from a mean of 96 metric tonnes and 6 per cent of fruit supply in January, to 46 metric tonnes and 2 per cent in February and eventually 9 metric tonnes and less than 1 per cent in March. Deliveries of ripe bananas rise slightly in this first three months from 214 metric tonnes in January to 271 in February and 261 in March. This constitutes a rise of from 19 per cent to 25 per cent of fruit deliveries. The first three months of coconut deliveries

rise on average from a mean of 563 metric tonnes in January to 630 in February and then 692 in March, increasing their proportion of fruit deliveries from 50 and 51 per cent in the first two months of the year to 57 per cent in March. Overall fruit supply declines relatively sharply in April, probably because of the difficulties of maintaining supplies through the rainy season, which particularly affects access to the main producing areas of these commodities, most of which are in highland areas, with relatively poor roads.

Figure 4.19 Mean Monthly Delivery of Other Fruits to Kariakoo 1981 to 1988

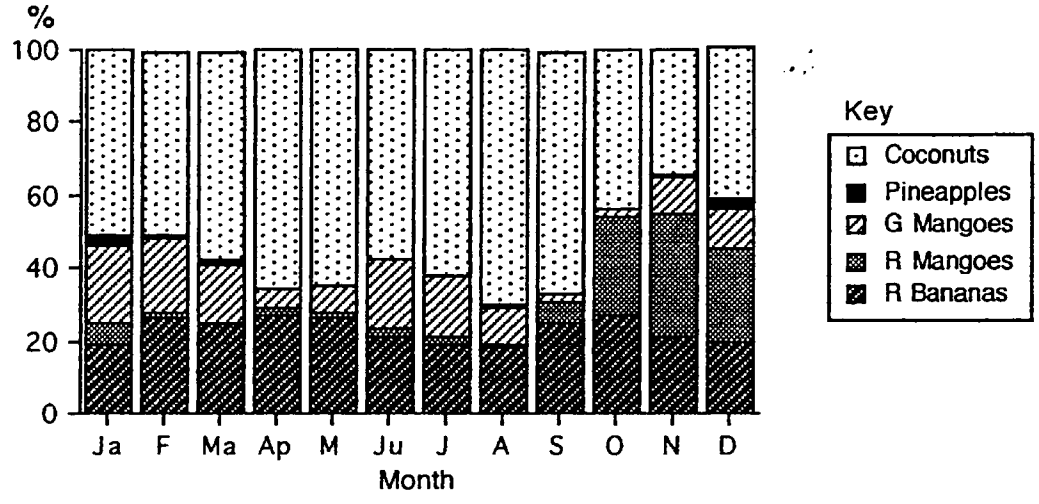


The dry season from May through to July is characterised by a climb in fruit supplies to Kariakoo, reaching its peak in August. As can be seen from Figure 4.19, an important factor in this peak is the increase in coconut supplies, which reach their mean monthly peak of 888 metric tonnes and 70 per cent of fruit deliveries in that month. A second important component of this period's high fruit deliveries is the second peak in supply of green mangoes, at a mean of 232 metric tonnes in July and 190 metric tonnes in August, accounting for 17 per cent. and 10 per cent respectively (Figure 4.20). As these two dry season fruits decline in delivery in September, from their August peaks, so does the overall fruit supply. The main wet season fruits have not yet been harvested.

A rise in mean monthly deliveries of ripe mangoes and ripe bananas in October and November are the main cause of the third overall peak of fruit deliveries at Kariakoo, 320 metric tonnes of ripe bananas form the peak mean monthly delivery of this fruit in October, accounting for 27 per cent of fruit deliveries, while ripe mangoes reach a peak mean monthly supply of 373 metric tonnes in November. Pineapples do not account for a high proportion of the mean monthly fruit supplies, the main pineapple season is December and January, when there was a mean

monthly delivery of 34 metric tonnes in each month, accounting for only 3 per cent of fruit deliveries each time.

Figure 4.20 Percentage of Mean Monthly Fruit Deliveries to Kariakoo 1981 to 1988



4.4 Daily Volumes

As described in Chapter Three, the data concerning daily variations in the volumes of fruit and vegetable supplies were sampled from Kariakoo Market Corporation's records. The sample consisted of the data from a randomly selected day from each week between January 1987 and August 1989, as explained in Chapter Three. Data from one hundred and thirty-eight days were sampled, from a possible nine hundred and sixty-six days, between January 1987 and August 1989 (a 14 per cent sample).

Table 4.2 presents the daily variation of the volume of each commodity group. The range of the sums of mean daily volumes for each weekday ranges from 94 to 140 metric tonnes. The week begins on Monday at 106 tonnes, drops to 94 tonnes on Tuesday, before climbing through the rest of the week to peak on Friday at 140 tonnes. The week ends on Sunday at 99 tonnes. In terms of overall volume of deliveries, this is partly the result of the three most important commodities, Irish potatoes (accounting or 31 per cent of all deliveries on Fridays), coconuts (accounting for 13 per cent), cabbage (10 per cent) and tomatoes from Moshi/Dodoma (10 per cent) all reaching their maximum mean daily supply on Friday. The peak on Friday may be explained in two ways. Firstly, many Dar es Salaam employees are paid on a weekly basis, being paid towards the end of the week and hence have cash available on that day. Secondly, households buy sufficient food to see them through the weekend. It may also be the case that peak deliveries result from the influence from the supply end, where a large number of rural periodic markets on Thursdays encourage a greater volume of Friday deliveries to Dar es Salaam.

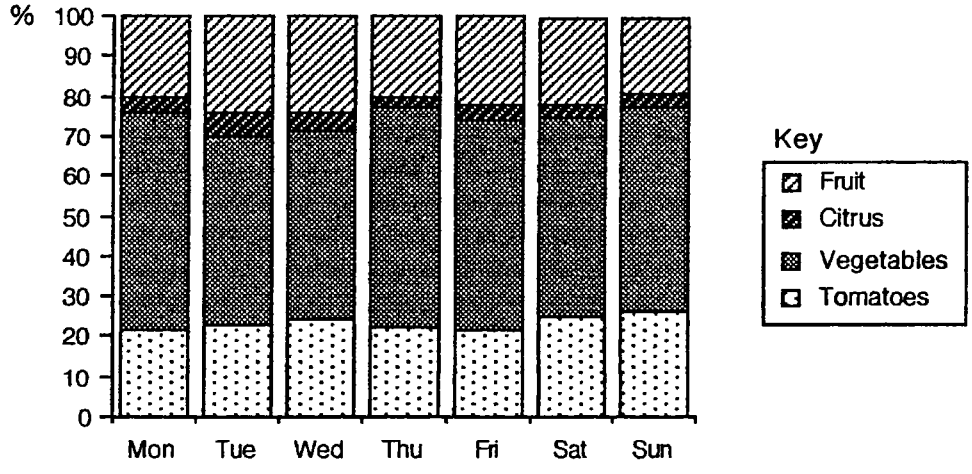
Table 4.2 Mean Daily Volume of Deliveries of the Main Commodity Groups (M. Tonnes)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Tomatoes	23	21	25	27	30	31	26
Other Vegetables	57	45	48	66	73	62	51
Citrus	4	5	5	3	5	4	3
Other Fruit	22	23	25	25	31	27	19
Sum	106	94	102	122	140	124	99

Source: Kariakoo Market Records 1981-89

The most notable feature of Figure 4.21 is the level of stability in the proportion of volumes accounted for by each commodity group over the week. However, variations do exist. Fruit on Tuesday and Wednesday accounts for its highest proportion at 24.4 per cent and 24.1 per cent respectively. Citrus fruits also favour Tuesday, peaking at 5.4 per cent of overall deliveries, while tomatoes favour Wednesday (24.1 per cent) and Sundays (26.4 per cent). The peak mean daily deliveries of other vegetables occur on Monday (54.3 per cent) and Thursday (54.3 per cent).

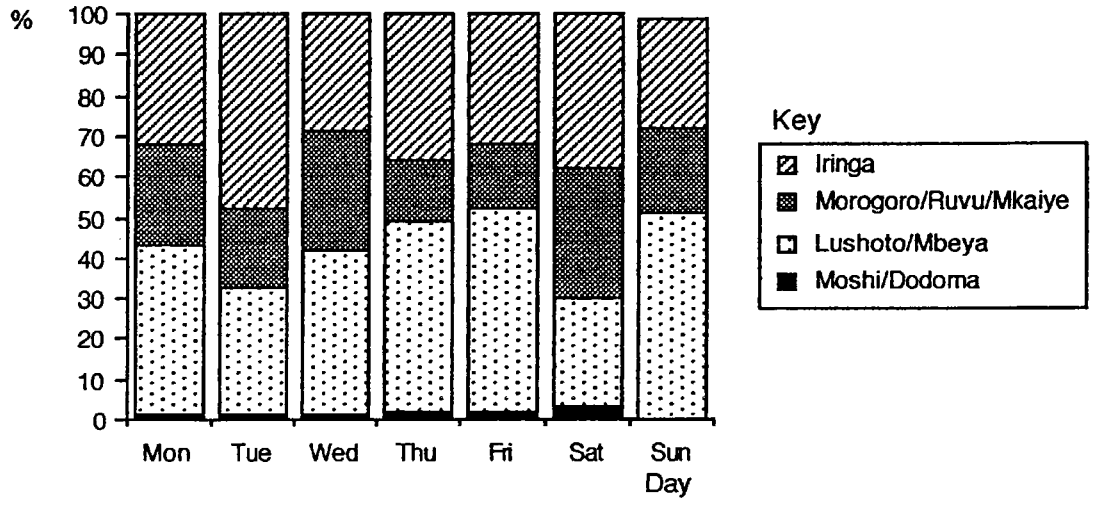
Figure 4.21 Mean Daily Delivery of Fruit and Vegetables to Kariakoo



There is a greater degree of variation within each commodity group, however. For example, while deliveries of each of the four types of tomato peak on Friday or Saturday, they all have secondary peaks on quite different days during the week. Tomatoes delivered from Lushoto and Mbeya reach their highest volume on Friday, with 15.1 tonnes on average, accounting for 50 per cent of the tomato supply for that day, but they account for the highest proportion on Sunday (51 per cent). This is clearly the most important tomato type accounting for a mean proportion of 41 per cent. Tomatoes from Iringa peak in absolute terms at a mean of 12 tonnes on Saturday (accounting for 39 per cent of that day's tomato supply), while in terms of the proportion of total tomato deliveries, they peak at 48 per cent on Tuesday (10.1 tonnes). Tomatoes from Morogoro, Ruvu and Mkaiye are delivered in the greatest volumes on

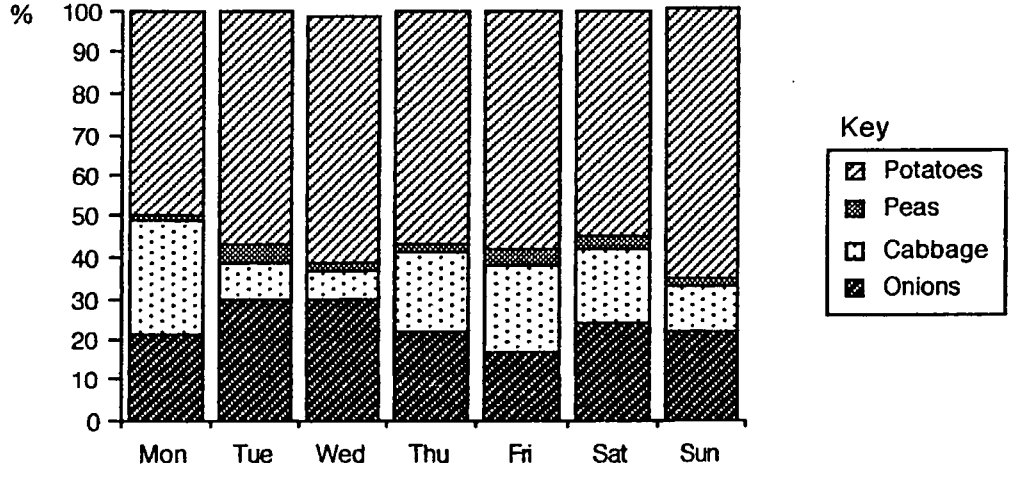
Wednesdays (29 per cent and 7.1 tonnes) and Saturdays (32 per cent and 9.63 tonnes). Tomato deliveries from Moshi and Dodoma build up gradually through the week from 1 per cent on Monday to 3 per cent on Saturday (0.2 tonnes to 0.8 tonnes). On Sunday the mean delivery falls back to 0.01 tonnes, an amount too small to account for one per cent of that day's mean tomato supply.

Figure 4.22 Mean Daily Delivery Profile of Tomatoes to Kariakoo



In the case of other vegetables, Friday is the most important day in terms of mean volume of deliveries (Table 4.2). In terms of proportion, however, Monday and Thursday are the most important days for vegetable deliveries, both at 54 per cent (57 and 66 tonnes respectively). Within the vegetables group the daily variations are considerable. Figure 4.23 demonstrates that Friday has the highest mean volume of deliveries for peas and Irish potatoes and an important secondary peak for cabbage.

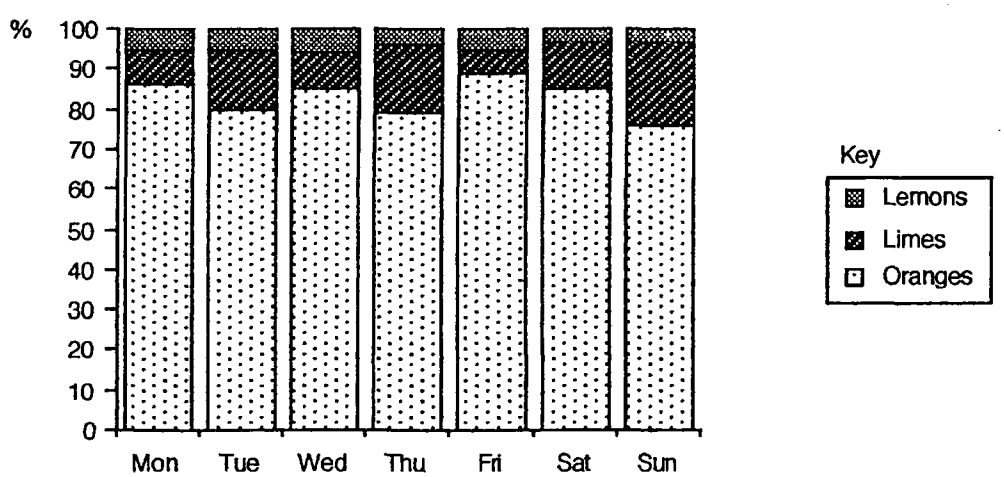
Figure 4.23 Mean Daily Delivery Profile of Other Vegetables at Kariakoo



Potatoes are easily the most important vegetable crop in terms of volume to be delivered to Kariakoo, accounting for between 50 per cent (on Monday) and 60 per cent (on Tuesday) of the mean volume of vegetable deliveries, and between 27 and 34 per cent of the overall mean daily volume of deliveries. Its main day in terms of absolute volume, with 42.9 tonnes, is Friday, while the lowest mean delivery is on Tuesday with 25.9 tonnes. The large proportion of vegetable deliveries accounted for by potatoes exerts considerable influence on the pattern of overall vegetable supply. The largest mean daily delivery of potatoes is made on Friday, and, in spite of the fact that the other vegetables highest mean daily deliveries are on other days this is the day on which the highest mean vegetable delivery is made.

The peak delivery days for onions are Wednesday and Thursday, which are almost the same in absolute terms at 14.2 and 14.4 tonnes respectively. In terms of proportion, Wednesday accounts for 30 per cent and Thursday for 22 per cent. Cabbage seems to vary the most from day to day, from 7 per cent and 3.8 tonnes on Wednesday to 28 per cent and 16 tonnes on Thursday. Peas account for no more than 4 per cent of the sum of means, which it achieves on Tuesday with 1.7 tonnes and also on Friday with 2.8 tonnes, the latter being the largest mean delivery.

Figure 4.24 Mean Daily Delivery Profile of Citrus Fruit at Kariakoo

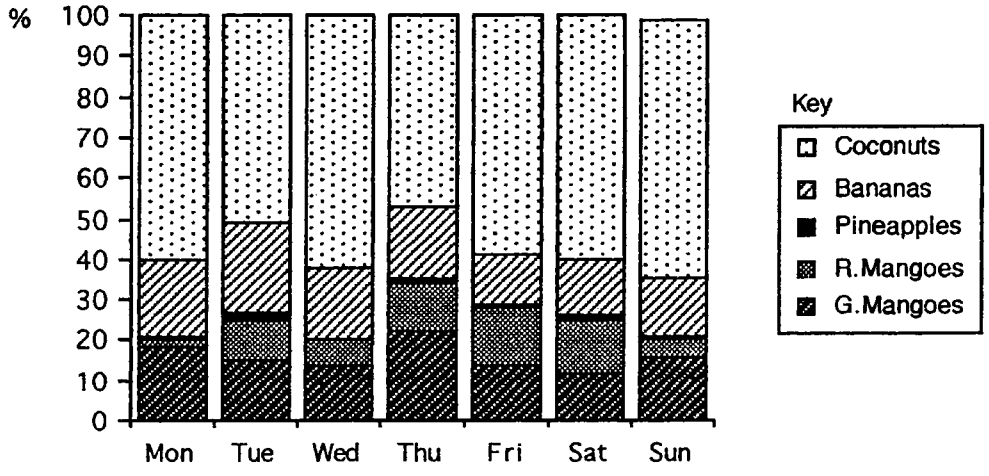


Mean citrus supply is maintained at around 4 tonnes daily throughout the week, although it reaches 5 tonnes on Tuesday, Wednesday and Friday. In terms of proportion of overall supply, it peaks on Tuesday at 5.6 per cent (Figure 4.24). By far the most important citrus crop are oranges, accounting for between 76 and 89 per cent of mean daily volumes (lowest on Sunday, highest on Friday). This pattern of dominance is very clear from Figure 4.20. This shows that lemons maintain a relatively steady proportion of the overall citrus delivery - reflected in a stable volume of delivery of between 0.13 and 0.41 tonnes. Limes and oranges on the other hand appear to complement each other, one peaking when the other is at its lowest and vice versa. Limes are more important on Tuesdays (with 15 per cent), Thursdays

(with 17 per cent) and Sundays (21 per cent), while oranges are at their most important on Wednesdays (with 85 per cent) and Fridays (89 per cent).

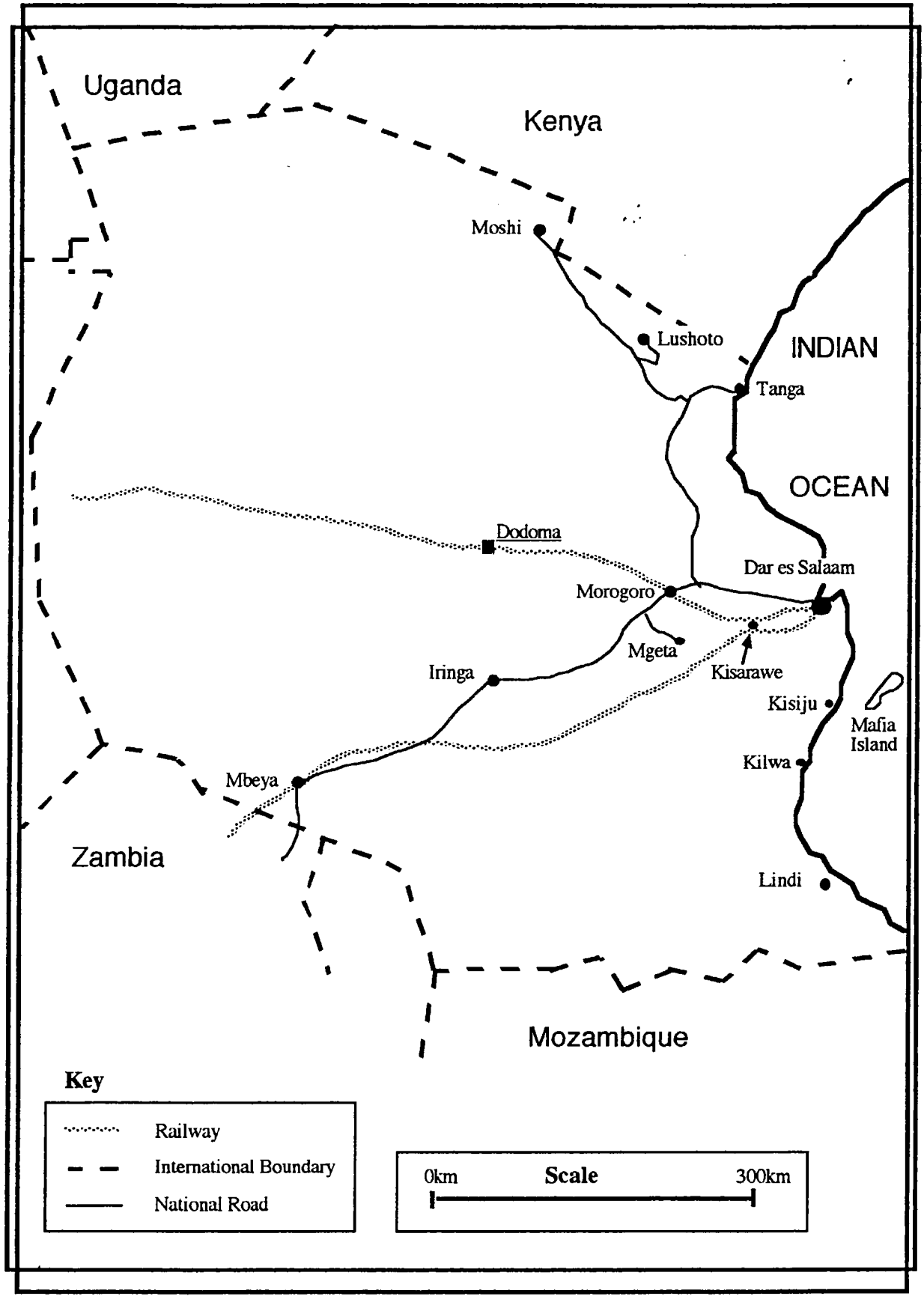
The deliveries of the final main commodity category, other fruit, range from 18.8 to 24.4 per cent and from 19 to 31 tonnes of the overall mean daily volumes (Figure 4.25). The peak day is Friday with a mean delivery of 31 tonnes (accounting for 22 per cent of all deliveries on that day), whereas in relative terms, fruit is strongest on Tuesday accounting for 24 per cent (or 23 tonnes).

Figure 4.25 Mean Daily Delivery Profile of Fruit at Kariakoo



Examining the greater proportional variations for individual fruit, seen in Figure 4.25, coconuts are the most important fruit type accounting for between 48 and 64 per cent of mean daily fruit deliveries. The most important days for coconuts in terms of mean tonnage are Friday at 18 tonnes, when deliveries of most commodities are not at their highest, with a secondary peak on Wednesday at 15 tonnes. The lowest mean daily delivery occurs on Tuesday (Appendix 4.3). In terms of the proportion of total fruit deliveries, the most important days are Sunday at 64 per cent, with a secondary peak on Wednesday at 62 per cent. Coconut deliveries account for the lowest proportion of overall fruit deliveries on Thursday at 48 per cent. Reports from informants in Dar es Salaam suggest that the main areas of prodction of coconuts are Mafia Island and Kisiju, both to the south of Dar es Salaam (see Map 4.1). One explanation of the reason for coconuts being at their highest may involve the boats delivering from Mafia Island running regular trips. If this is so, then a boat arriving on a Sunday is likley to result in a larger supply to the market on that day. If this is known by the coconut purchasers, they will tend to avoid days of low supply. This will have the cumulative effect of having days on which coconuts are known to be in good supply, and when the coconut market is busy, and days when the supply is not so good and the market consequently is not so busy. By Thursay the coconuts delivered at the weekend are almost sold out and the deliveries may be at their lowest.

Figure 4.26 Key Towns and Cities in the Supply of Fruit and Vegetables to Dar es Salaam



Deliveries of green mangoes and ripe bananas range from 12 per cent on Saturday for mangoes and Friday for bananas, to 22 per cent on Thursday and Tuesday respectively. In tonnage delivery terms, bananas range from 2.5 tonnes on Sunday to 5 tonnes on Tuesday and green mangoes from 3 on Sunday to 5.5 tonnes on Thursday. These two crops are very similar in terms of size and pattern of delivery to Kariakoo. In addition to the similarity displayed in these data, these two fruits are consumed as a snack. In contrast to the ripe mangoes and oranges, which are consumed as thirst quenching snack, these are consumed for energy and often substitute as a midday meal.

Ripe mangoes range from 2 per cent of mean fruit deliveries (and 0.3 tonnes) on Monday, to 14 per cent and 4.3 tonnes on Friday. Pineapples maintain a relatively low but stable supply throughout the week, ranging form 0.1 tonnes, which is not large enough to register a single percentage point, on Wednesday to 0.4 tonnes, and the highest proportion of mean fruit deliveries at 2 per cent, on Tuesday.

An overview of the relative variability of each individual commodity can be found in Table 4.3 presenting the overall mean, standard deviation and analysis of variance. The low F ratios in the results of the analysis of variance suggest a wide range of variability from commodity to commodity during the week. A brief review of the likely channels of distribution will help to explain this variability. A much more detailed examination of these channels of marketing is presented in Chapters Five and Six.

Table 4.3 Overall Mean, Standard Deviation and Analysis of Variance of the Kariakoo Daily Delivery Volumes

Commodity	Overall Mean	Standard Deviation	Analysis of Variance F Ratio	Significance
Tomatoes				
Moshi/Dodoma	0.386	1.29	0.783	0.594
Lushoto/Mbeya	11.089	11.73	1.056	0.394
Moro./Ruvu/Mkaiye	5.972	11.31	0.537	0.778
Iringa	8.982	8.90	0.854	0.531
Onions	13.227	11.43	0.929	0.477
Cabbage	9.680	19.01	1.040	0.405
Peas	1.513	1.52	3.069	0.009
Irish Potatoes	33.499	36.67	0.323	0.923
Oranges	3.516	3.52	0.913	0.489
Limes	0.497	0.72	1.137	0.348
Lemons	0.191	0.55	1.488	0.210
Green Mangoes	3.801	3.80	0.949	0.468
Ripe Mangoes	2.299	2.30	1.009	0.450
Pineapples	0.249	0.50	0.618	0.715
Ripe Bananas	3.978	2.77	2.094	0.059
Coconuts	14.292	9.97	1.249	0.287

Source: Author's Calculations

One of the main collection points in Morogoro is a purpose-built wholesale market building in Mgeta Division. The buyers begin their work here negotiating their price with farmers who have not necessarily brought their produce here, but bring their produce to meet the lorry as it proceeds from the market building to Dar es Salaam. At collection points along the road the produce is then repacked by paid labour, this may cost up to TShs 40 per *gunia* in labour. The trader buying the produce accompanies the lorry, which may have been hired locally, from business people in the area, or from Dar es Salaam, to Dar es Salaam to sell the produce at Kariakoo. There appeared to be a greater likelihood of being able to hire a lorry locally in Lushoto District, than in Mgeta Division, the latter having far less established capital.

Once the lorry has deposited its load at Kariakoo, it will return immediately to the source area, or even to the same collection points, if there is the prospect of more produce requiring transportation. At peak harvest time, such as when the author was visiting the area, a lorry may make two round trips between Mgeta and Dar es Salaam (a 4-5 hour journey) in 24 hours.

By contrast the more commercially-developed area of Lushoto District in Tanga Region, which was also visited by the author, has a periodic market system which forms the focus for the district's marketing activities. The main function of these markets is the exchange of goods between small farmers and between the farmers and village or town-based consumers, although they also fulfil many cultural, social and political needs besides. In addition to this, at the spatial margins of the market area, wholesalers meet with producers and negotiate prices for their produce. For example, Photograph 4.1 shows Soni market in Lushoto District, where produce is often brought to the market to sell to the wholesale traders, seen to the right of the main retail activities, which in Lushoto are generally carried out by the women. More frequently, a sample is brought to the market and the main bulk is collected later in the day by lorry and driven down to Dar es Salaam overnight to arrive in Kariakoo early the following morning. Clearly in this case the day on which the periodic market takes place has an influence on the volume of commodities which will eventually arrive at Kariakoo wholesale market. Although the supply from this area does not take place exclusively on the periodic market days, it will still have the effect of sending 'waves' of produce to Kariakoo during the course of the week. In the case of Soni the main market day for supply to Dar es Salaam is Friday.

Ignoring for the moment those commodities which have a very low mean daily delivery, such as those of less than 1 tonne, it can be hypothesised that commodities with a high coefficient of variance, in terms of their daily delivery, such as cabbage (196 per cent), tomatoes from Morogoro, Ruvu and Mkaiye (189 per cent), Irish potatoes (109 per cent) and tomatoes from Lushoto and Mbeya (106 per cent), are being supplied in 'waves', as described. Produce of lower daily variance such as bananas (69 per cent), coconuts (70 per cent) and onions (86 per cent), may originate from a variety of supply areas. This will have the effect of spreading the supply over the week and will reduce the impact of the 'wave' effects of periodic rural markets.

Potograph 4.1

Soni Market, Tanga Region[1]

1 Original in colour

This is the case for tomatoes, which have a wide range of source areas, each with a highly variable delivery from day to day, but overall with a relatively stable supply throughout the week at Kariakoo market.

Secondly, some produce is supplied from areas relatively close to Dar es Salaam. This has the less beneficial effect of, on the one hand, reducing the advantage of selling to a middleman who has the capital to buy and assemble large viable loads. On the other hand, it can be in the producer's interests to try to cut out the middleman and transport his or her produce the short distance to an urban market to sell directly, and hence receive a higher margin of profit. This is the case for green mangoes and oranges, where each have a significant proportion delivered from areas relatively close to Dar es Salaam. In each case there are reports of producers ferrying their own produce to the city by pick-up and selling small loads, such as one or two *gunia*, to street sellers or to sellers at retail markets. These small deliveries do not go through any periodic assembly in the same way as those described above, but, because the producers are closer to the market it may be expected that they will use their advantageous location to supply on days where they will obtain a good price. This is likely to have the effect of spreading the supply, as peri-urban producers try to avoid peak delivery days, but they will also avoid days when demand is low.

Thirdly, in some less commercially developed areas, such as the more peripheral areas of Lushoto District, where there is no periodic market system frequented by wholesale traders and farmers, traders may make several speculative trips into a particular potential supply area. Once a viable load has been assembled, the trader hires a lorry, collects the produce and heads for Kariakoo. In this process, the produce arrives in a rather random temporal fashion at Kariakoo, subject to its availability, and is not characterised by the 'waves' of areas where the periodic market has a strong influence. In addition, producers located close to the major trunk roads are able to take advantage of the traffic passing by. A lorry driver delivering charcoal to Dar es Salaam, for example, may use fresh produce from the roadside to fill extra space he may have in his lorry either by buying the produce or arranging to transport the produce and the farmer or trader to Dar es Salaam for a price. This additional, informally earned, income for the driver results in small random deliveries of produce arriving at markets on the main roads in Dar es Salaam, as the lorry drivers deliver the produce on their way to their formal destination. It also provides an additional marketing chain for the producers in the rural producing areas. Photograph 4.2 shows a producer with hired labour harvesting oranges and packing them for sale to the passing traffic. Note the large hessian *gunia*, or sack, used to transport about 80 kg of oranges and the use of grass as additional packaging to protect the oranges.

In summary, Friday is by far the most important day for overall delivery, with a mean total delivery of 140 tonnes, accounting for nearly 18 per cent of the total weeks business. This is influenced by the fact that six of the sixteen commodities have their highest mean daily delivery on Friday (coconuts, ripe mangoes, oranges, Irish potatoes, peas and tomatoes from Lushoto/

Photograph 4.2

Orange producers packing oranges for sale to passing traffic on the Korogwe-Mombo road, Tanga Region[2]

2 Original in colour

Mbeya). The lowest overall day of the week is Tuesday with an overall supply of 94 tonnes, accounting for less than 12 per cent of the week's total deliveries. This coincides with the occurrence of the minimum mean daily deliveries for Irish potatoes, coconuts and tomatoes from the Lushoto and Mbeya group, and the Morogoro, Ruvu and Mkaiye group.

Commodities with a highly variable daily delivery pattern, such as tomatoes from Moshi and Dodoma, lemons, pineapples and cabbage, have peak delivery days which coincide with important periodic markets in the supply areas. For commodities with a less variable daily supply, periodic markets have a reduced influence, resulting from a complementary supply from areas without a periodic market system. This has the effect of reducing the importance of produce delivered through the periodic market system. In addition, producers near the city are likely to use their more favourable location to supply the market at times which are beneficial to them. These producers are likely to avoid periods of over-supply and low demand, and hence concentrate their supply on days when they are most likely to achieve a fast sale at a good price.

In the case where the producing area is at some distance from the city it is necessary to bulk the commodities in order to ensure an economically viable load (Bromley 1978). When this is necessary, the system of bulking takes one of the two forms described above, either a system of periodic marketing exists, which can be used by the traders and farmers to meet and carry out their transactions, or the traders must go in search of their supply. Some stability can be ensured under the first system if producers or traders deal regularly with the same people. There are considerable risks involved in the latter system, such as not purchasing sufficient produce to ensure a viable load, but in more peripheral areas, where the prices are likely to be lower it is also possible for this more speculative type of trader to make a greater margin of profit. In the two areas visited by the author the first system generally involves rural-based traders, who are part-time farmers themselves, while the latter system generally involves urban-based traders. Finally, in areas close to Dar es Salaam, according to interviews with retailers in the city, the producers may come in to sell in the retail markets and the retailers may group together to make a trip into the rural areas to purchase direct from the producers. This confirms the description by Briggs (1990) of two of the marketing channels for peri-urban producers on the fringes of Dar es Salaam. The third channel involves selling in the nearest village market to other peri-urban dwellers, passers-by on the main roads entering the city or to urban dwellers coming out of the city to buy for home consumption. This latter system of marketing channels for the peri-urban fringe rarely involves any form of middleman, but, according to interviews with traders and residents of Dar es Salaam, they usually involve sales either between the producer and the retailer, or directly with the consumer.

4.5 Annual Variations in Price and Value

In the same way as annual variations in volume have been measured, so this section will examine the variations in annual real value and mean annual real prices per metric tonne for each

of the commodities. The values have been calculated using the Kariakoo Market Corporation's records of volume and value of deliveries at Kariakoo. The value and mean prices have then been deflated using the Tanzanian annual inflation rate for the years included in the data series, as published in Africa Review (Appendices 4.4 and 4.5).

Figure 4.27 Percentage Profile of Mean Annual Real Value of Fruit and Vegetable Groups at Kariakoo 1981 to 1988

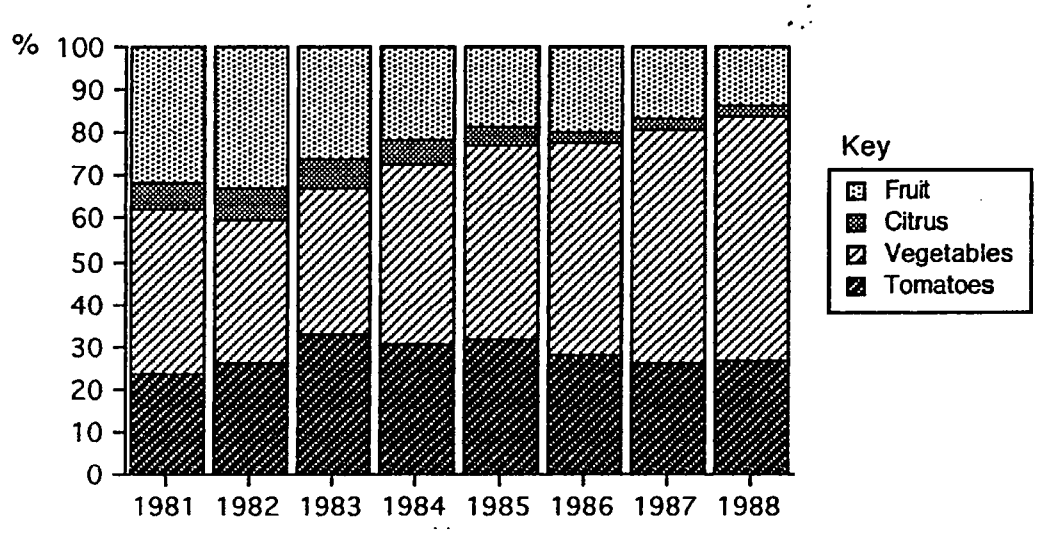
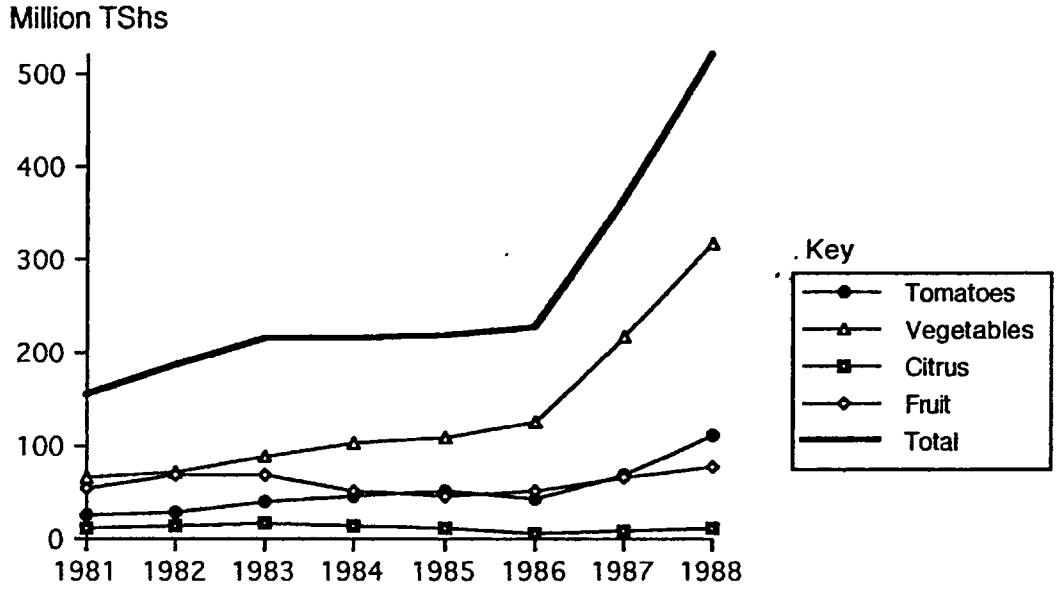


Figure 4.27 presents a view of the annual mean real value of fruit and vegetables delivered to Kariakoo over the sample period from 1981-88. There has been a noticeable decrease in importance of fruit and citrus fruit value arriving at the market. For fruit this decrease goes from 31.6 per cent to 13.8 per cent, while in the case of citrus this decrease has been from 6.2 per cent to 2.1 per cent. This decrease in proportion has occurred in spite of an absolute increase in real value from TShs 52.97 million to 76.34 million in the real value of fruit deliveries (an real increase of 44.1 per cent at 1981 values) and TShs 10.44 million to TShs 11.82 million (an real increase of 13.2 per cent) in the real value of citrus fruit deliveries. However, as Figure 4.28 demonstrates, in order for fruit and citrus to have maintained their relative proportions of total real value, it would have been necessary for there to have been a greater increase in real value of the deliveries of these commodities.

Vegetable deliveries at Kariakoo, on the other hand, have increased markedly from TShs 64.82 million in 1981 to TShs 318.46 million in real terms, an increase of 391 per cent, or 55 per cent per annum. The real value of tomato deliveries rose from TShs 39.57 million in 1981 to TShs 147.36 million in 1988, a real increase of 272 per cent. These sharp rises in real value of deliveries of these two commodity groups has resulted in tomatoes rising from accounting for 23.6 per cent of the real value of fruit and vegetables in 1981 to 26.6 per cent in 1988. In the case of vegetables this rise is from 38.6 per cent of the value of fruit and vegetable deliveries in 1981 to 57.5 per cent in 1988. This shifting in importance of the four main commodity groups confirms the earlier interpretation of similar patterns in the volume of these groups over the same time period discussed in an earlier section.

Figure 4.28 Annual Delivery Value of the Fruit and Vegetable Groups at Kariakoo



With reference specifically to tomatoes, deliveries by value from Moshi and Dodoma have decreased through to 1988 (Figure 4.29). The decline in real value of these tomatoes has been from TShs 2.43 million in 1981 to TShs 1.75 million in 1988 (Figure 4.30). This represents a decline in real value of this group of tomatoes, over the period, of 27.8 per cent, or a mean of 4.0 per cent per annum. By contrast, tomatoes from Lushoto and Mbeya record 33.5 per cent of the real value of overall tomato supply in 1981, and rise to account for 60.5 per cent of real tomato values by 1988. This might suggest an increase in the overall value of the tomatoes from Lushoto and Mbeya. However, interviews with farmers in Lushoto would suggest that the peak period during which tomatoes were supplied from these areas generally occurs at a time of the year when the supply of tomatoes in Dar es Salaam is low. This low supply, coupled with the continued high demand in Dar es Salaam, appears to have pushed up the price of tomatoes arriving in Kariakoo at this time of year. Indeed, some producers with sufficient capital are able to plant their tomatoes in order to harvest at this period, and take advantage of the low point in deliveries, and consequent increase in prices.

Figure 4.29 Percentage of the Real Value of Annual Tomato Deliveries to Kariakoo

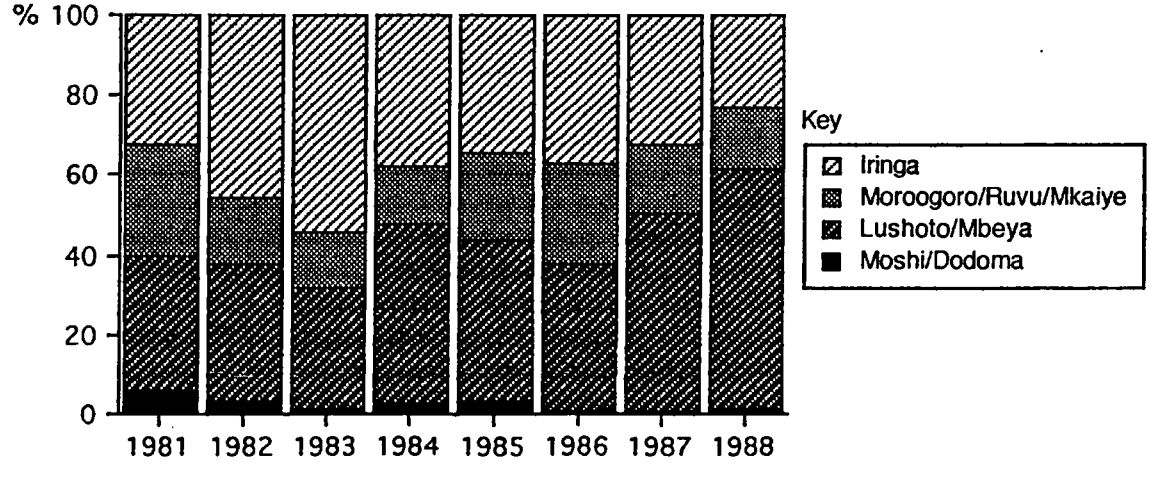
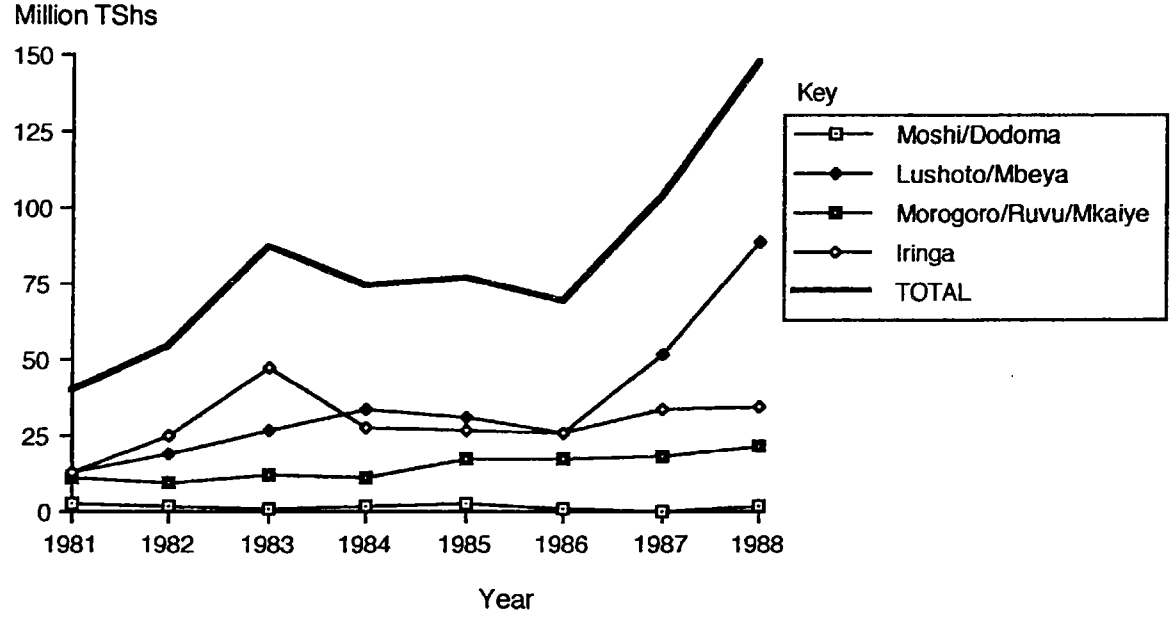


Figure 4.29 also shows that, after an initial decrease in the proportion of the real value of tomatoes from Morogoro, Ruvu and Mkaiye, declining from 28.0 per cent in 1981 to 13.7 per cent in 1983, the next three years see a modest recovery to reach 25.1 per cent of overall real tomato values by 1986, but this is followed, in turn, by a further decline again to 14.9 per cent by the end of the period. The proportion of tomatoes accounted for by those from Iringa increase between 1981 and 1983 from 32.4 per cent to 54.5 per cent, but then decrease steadily until 1988 to 23.4 per cent. This is reflected in the real values, which begin the period at TShs 12.8 million, and increase to TShs 47.51 million by 1983. In 1984 the real value of the Iringa tomato deliveries dropped to TShs 27.9 million. During the latter years of the period the real value of deliveries of tomatoes from this region increased again, reaching TShs 34.54 million by the end of the period.

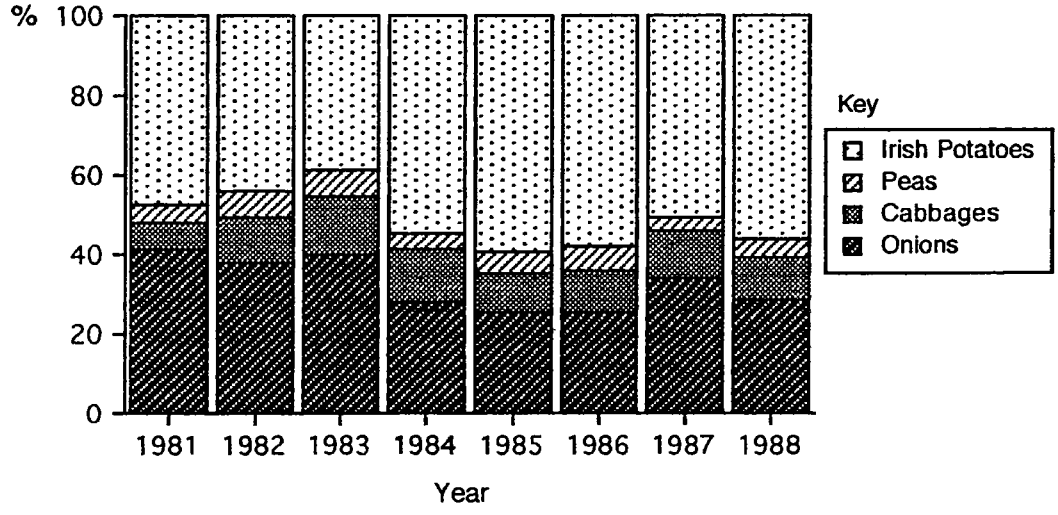
Figure 4.30 Real Value of Tomato Deliveries at Kariakoo



The proportion of the value of vegetable commodities delivered at Kariakoo is represented in Figure 4.31. This barchart shows that the proportion of pea and cabbage real value of deliveries rose between 1981 and 1983 from 4.6 to 7 per cent in the case of peas. This represents an increase in real value from TShs 3.01 million to TShs 5.38 million (Figure 4.31), and from 6.6 to 15.3 per cent in the case of cabbage, and a real value increase from TShs 4.30 million to TShs 13.68 million. The real value of cabbage deliveries then declined to around 10 per cent of total vegetable values by 1985 and remained at that level until 1988. However, the pattern of real value of cabbage remained at between TShs 11 million and 13 million between 1983 and 1986, increasing to TShs 34.15 million by 1988. This is a real value increase of 694 per cent or 99 per cent per annum. The real value of peas declined to 3.8 per cent of vegetable value in 1984, rose again to about 5.5 per cent in 1985 and 1986, declining in 1987 to 3.7 per cent and finally rose to 4.8 per cent, appearing to form a pattern of two years of high delivery value followed by one of lower value. However, this is reflected in terms of the real values as a

general increase over the period, with one year of decreased value in 1984. The real value of the pea deliveries at Kariakoo in 1981 was TShs 3.01 million. The value of deliveries of peas climbed to TShs 5.38 million by 1983. In 1984 a modest decline in value to TShs 3.93 million was recorded, but the last four years of the period recorded a steady increase in the real value of pea deliveries, reaching TShs 15.26 million by 1988, a real increase of 407 per cent, or 58 per cent per annum

Figure 4.31 Percentage Profile of the Real Value of Annual Vegetable Deliveries to Kariakoo

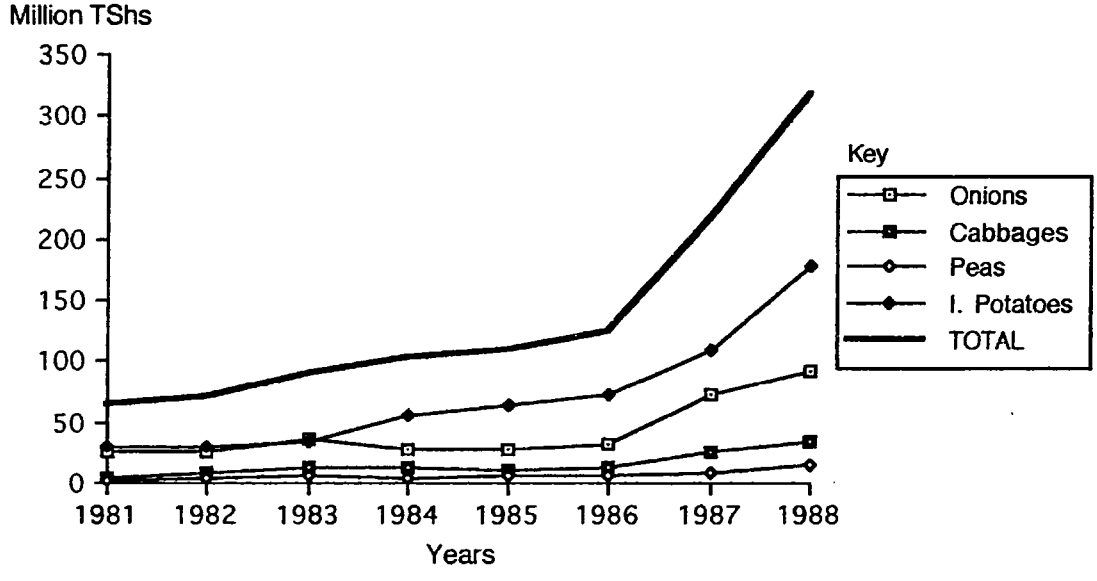


Onions begin the period at 41.3 per cent, and decline to 25 per cent in 1985 and 1986. The onion value then increased to account for 34.1 per cent of vegetable value in 1987, before finally declining to a proportion of 28.8 per cent by 1988. This decline in the importance of onions is likely to be partly the result of the increasing proportion accounted for by Irish potatoes. As Figure 4.32 shows, onions increase in value along with the other vegetables after the Tanzanian economy's lowest point was reached in 1986. The proportion of the vegetable delivery values accounted for by potatoes began in 1981 at 47.5 per cent. This is followed by a decline to 38 per cent in 1983, an increase to 59.4 per cent by 1985 and finally declining to 50.6 and then 55.7 per cent in 1987 and 1988. Irish potatoes were at their peak in terms of proportion of vegetable value in 1985 and 1986, when the Tanzanian economy was at the low point of its recession. Irish potatoes offered a cheap form of bulk vegetables, which could be added to a vegetable stew where possible, or simply boiled and eaten.

The real value of Irish potato deliveries in 1981 were TShs 30.78 million. They increased steadily throughout the period, reaching TShs 177.29 million by 1988, a real increase of 476 per cent, or 68 per cent per annum. The reason for this consistent increase in the value of potato deliveries may be explained partly by the deepening political crisis affecting Tanzania during this period. As people in the urban areas found their income being held at a consistently low level, and prices for basic food commodities subject to inflation rates of 30 per cent or more, they sought alternative, cheaper means by which to feed themselves. Irish potatoes are a carbohydrate-rich

food which can be consumed in the place of the staple foods, such as maize and rice, the formal marketing of which was still strictly controlled at that time. The alternatives open to the urban population were: firstly, to try to obtain staples from the controlled, but inefficient formal marketing sources; secondly, to buy staples from the relatively more efficient, but highly priced illegal market; or to adopt alternatives, such as Irish potatoes, as a main food. What is surprising, although it is still early to draw firm conclusions, is that the liberalisation of the main staple grain markets in 1986 have not had an influence on the value of Irish potatoes still being delivered to Kariakoo. Clearly, there is still demand for this vegetable. Its importance during this period is demonstrated in the fact that, of each of the vegetables covered in this analysis, it is the only one which consistently increased the real value of its annual delivery over the entire period.

Figure 4.32 Annual Real Value of Vegetable Deliveries at Kariakoo

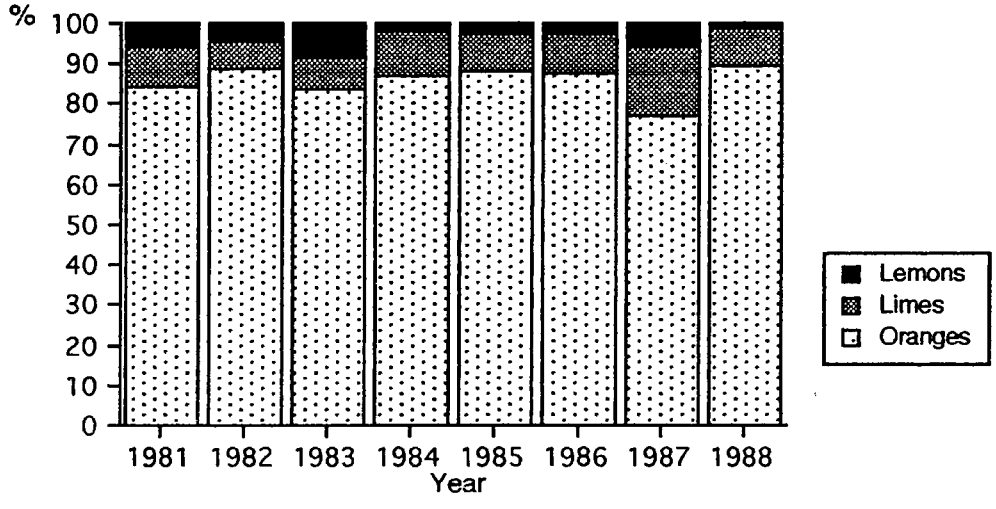


Oranges do not account for less than 77 per cent of the annual real value of deliveries of citrus fruit, and account for up to 89 per cent of total citrus values (Figure 4.33). These annual variations are mirrored by the variations in the real values presented in Figure 4.34. For example, the value of orange deliveries in 1981 is TShs 8.80 million, rising to a peak in real value of TShs 15.05 million in 1983, before declining slowly through the years of the height of the economic crisis in Tanzania to TShs 5.19 million in 1986. The real value of the orange deliveries then begin to pick up, rising to TShs 10.61 million by 1988. In view of the declining volume of orange deliveries, reported in an earlier section, the variations in real value are likely to have more to do with the inflation rate, business confidence and the changing costs of transportation as the period of the 1980s developed, declining to the low point of 1986 and showing modest recovery by the end of the period, rising once again above the 1981 level. The consumption of oranges, as a snack food, is likely to be more adversely affected by worsening economic circumstances. As urban consumers' incomes are squeezed they are more likely to continue buying staples, such as the grains, potatoes and cooking bananas and the main foods, such as

onions and tomatoes, even if in smaller quantities. However, the urban consumers are also more likely to go without foods such as oranges, which are not as important to their survival.

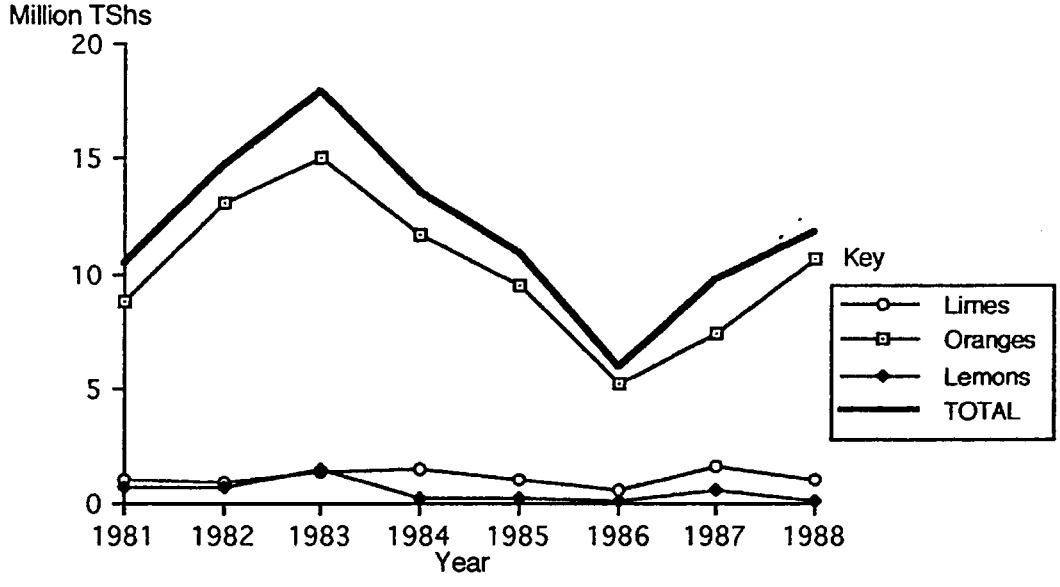
Because of the very high proportion of the citrus deliveries accounted for by oranges, they have a very strong influence on the real value of overall citrus deliveries reported earlier.

Figure 4.33 Percentage Profile of the Real Value of Annual Citrus Fruit Deliveries to Kariakoo



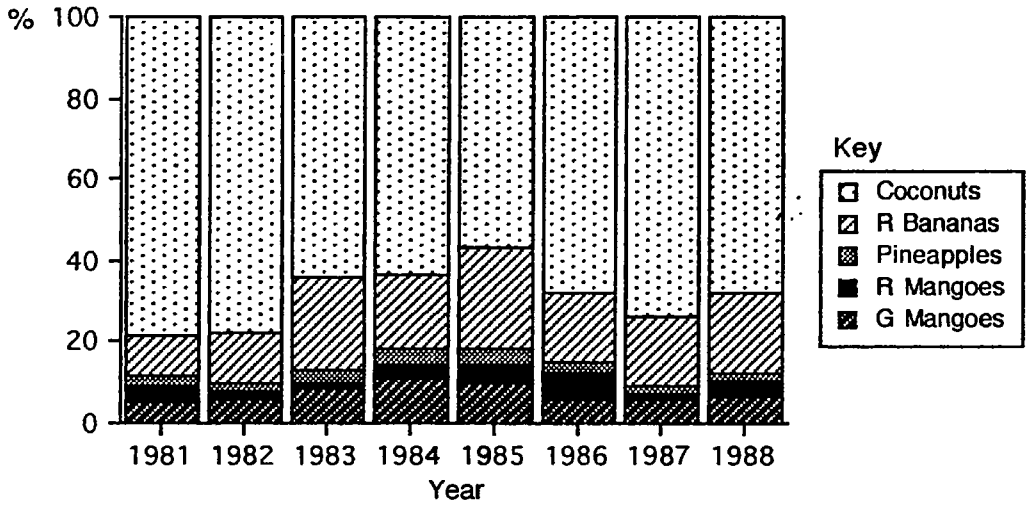
The annual value of lime deliveries begin the period at TShs 0.99 million, declines to TShs 0.95 million, before rising to TShs 1.52 million by 1984. This results in lime value accounting for 9.5 per cent of citrus deliveries in 1981, decreasing to 6.5 per cent in 1982 and rising to 11.2 per cent by 1984. The annual real value of deliveries in 1985 and 1986 declined to TShs 0.99 million and then TShs 0.59 million, accounting for 9.2 and 9.9 per cent of the real value of citrus fruit deliveries respectively. 1987 saw a strong recovery of lime values reaching TShs 1.67 million or 17.3 per cent of citrus delivery value, however, it declined once more in 1988 to TShs 1.09 million, accounting for 9.2 per cent of citrus value. There is no clear explanation for the faster recovery of limes after the 1986 low point for citrus fruits. It is likely to be linked to their special place in this category, as they are usually consumed as a garnish to main meals, and therefore the lime consumption patterns tend to follow that of the vegetables more closely than that of their counterparts in the citrus group category.

Figure 4.34 Annual Real Value of Citrus Fruit Deliveries at Kariakoo



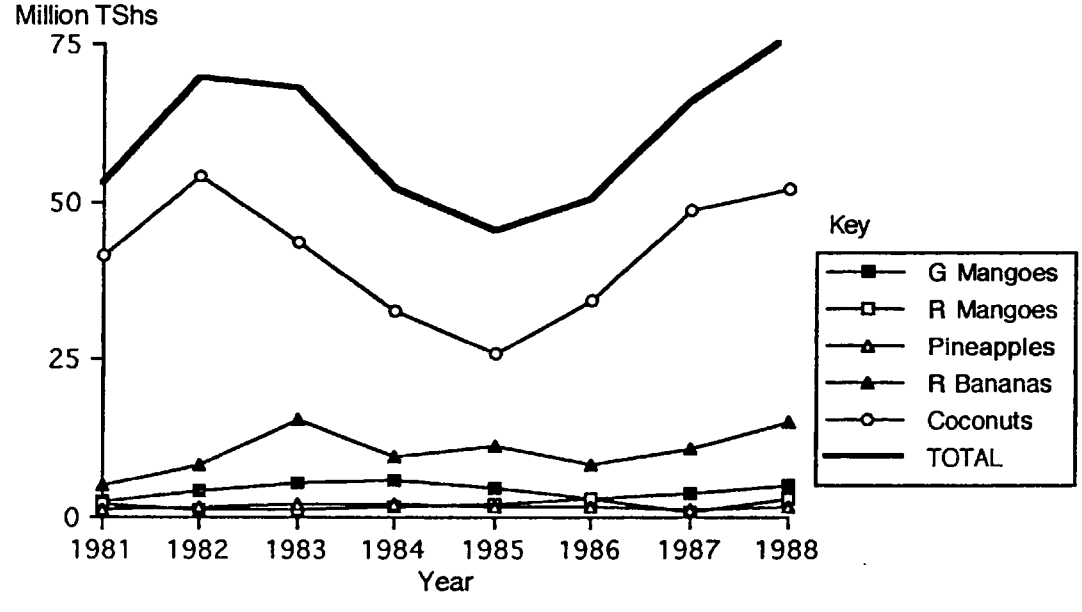
Lemons account for 6.2 per cent of the value of citrus fruit deliveries at Kariakoo in 1981, and rise, after a decline in 1982 to 8.5 per cent in 1983. The next three years, through which the Tanzanian economic crisis worsened, saw lemons account for only between 2.1 per cent in 1984 and and 2.6 per cent in 1985. The real value of lemons increases to account for 5.6 per cent of citrus deliveries in 1987, but the period ends with lemons accounting for only 1 per cent in 1988. Clearly, oranges have continued to dominate this declining group of commodities, whilst the value of lemon deliveries has declined in importance, even relative to other citrus fruits. Figure 4.34 demonstrates the decline of the real value of lemon deliveries at Kariakoo. They begin the year at TShs 0.65 million, rise to their peak in real value at TShs 1.52 million in 1983. The next year the value of lemon deliveries had fallen to TShs 0.28 million and remained there in 1985, declining further to TShs 0.15 million. In 1987 there is a slight recovery, with a rise in value to TShs 0.54 million, but 1988 records the lowest annual real value of the period at TShs 0.12 million. Clearly, lemon deliveries are not an important component of Kariakoo's business, accounting for between less than one tenth of one per cent in 1988 and just over one half of one per cent of the total annual real value of fruit and vegetable deliveries at Kariakoo in 1983. Lemons are one of only two of the commodities covered which declined in terms of the real value of their deliveries at Kariakoo, in spite of a real increase in price. A possible explanation for the decline in importance of the lemons and limes being delivered at Kariakoo is that as a specialist food, and as one which is generally bought and sold in much smaller quantities, it is likely that this feature of these commodities lends itself to the informal market. One of the difficulties of the informal market is the lack of facilities for handling the large quantities often shipped from up-country producing locations. However, in the case of these two commodities they would be much easier for an informal trader to purchase and distribute, with fewer difficulties to overcome.

Figure 4.35 Percentage Profile of the Real Value of Annual Fruit Deliveries to Kariakoo



The annual real value of other fruit commodities is dominated by the value of coconut supply (Figure 4.35). This fruit began the period accounting for 78.6 per cent of the value of other fruit supply, and decreased to 57.0 per cent by 1985. Coconut value made a recovery during 1986 and 1987, rising to account for 74.0 per cent of the real value of fruit deliveries in 1987, but declined again to 67.8 per cent by 1988. The importance of the value of coconut deliveries to the overall fruit delivery values is demonstrated in the graph of real value of deliveries (Figure 4.36). The real value of coconut deliveries increased from TShs 41.64 million in 1981 to the highest annual value of the period at TShs 54.09 million in 1982. A decline in 1983 to TShs 43.59 million was followed in the next two years with further declines reaching TShs 25.78 million in 1985. The latter three years were marked by a recovery of the value of coconut deliveries to achieve TShs 51.79 million.

Figure 4.36 Real Annual Value of Deliveries of Other Fruit to Kariakoo



Ripe bananas begin the period accounting for 9.6 per cent of the fruit value, rising to 22.8 per cent in 1983, declining slightly to account fro 18.4 per cent in 1984, before a rise to account for 24.7 per cent of fruit values in 1985. This is reflected in a rise from TShs 5.10 million shillings worth of ripe bananas delivered during 1981 to TShs 15.48 million in 1983. There then follows a period of uncertain change as the value of ripe banana deliveries fluctuates between around TShs 9 million and TShs 11 million, as the economy reached the lowest point in its crisis. The last three years of the sequence see a consistent rise in the value of deliveries almost reaching 1983 levels with a real value of delivery of TShs 15.01 million.

Pineapples began the period at 2.6 per cent in 1981 increased to 4.1 per cent in 1985 and then decline to 1.8 per cent in 1987, finally rising to account for 2.3 per cent of the fruit value by 1988. Ripe mangoes began in 1981 accounting for 4.1 per cent of fruit value in 1981, decreased to 1.6 per cent in 1982 and 1.7 per cent in 1983, but over the next three years rose again to 6.0 per cent, before declining to 1.5 per cent in 1987 and 2.3 per cent by 1988. Green mangoes increase in value from 5.0 per cent in 1981 to 11.4 per cent in 1984 They declined to 5.8 per cent of fruit value in 1987 and finally to 6.6 per cent in 1988.

Over the period the relative fruit values vary considerably. Coconuts remain the most important of fruit commodities, in terms of delivery values, although, as described, they decline in proportion of value from 78.6 to 67.8 per cent over the period, but a net real value increase of 24.3 per cent. Pineapples and ripe mangoes also declined in relative importance, from 2.6 per cent in 1981 to 2.3 per cent in 1988 and from 4.1 to 3.6 per cent respectively. Ripe bananas and green mangoes have a net proportionate increase, from 9.6 per cent in 1981 to 19.7 per cent in 1988 and from 5.0 per cent in 1981 to 6.6 per cent in 1988. The first two years of the period see a strong rise in the value of deliveries of all commodities. The following three years, up to 1986 see a decline in all commodities, most strongly evident among the fruits and citrus fruits. Finally, the last two years see a strong rise in the value of deliveries of all commodities, most strongly in the vegetables and, to a lesser extent, tomatoes.

None of the fruits are used in basic cooking and are not, therefore, considered as an important food for survival. It is to be expected, therefore that in times of a depressed economic situation, the market for these commodities will decline considerably. This has happened in both the case of citrus fruits and other fruits as demonstrated in the graphs of real value of deliveries in Figures 4.32 and 4.34. During this time the deliveries values of the vegetables did not decline, its increase merely slowed (Figure 4.30) and the real value of tomato deliveries declined by a only limited amount (Figure 4.28). The importance of vegetables to the diet and their lower demand elasticity means that the effect of periods of national economic difficulty will be reduced on these commodities. Thus during the mid 1980s, it may be expected that the initial decline in the importance of fruit may be the result of low demand. However, as the country's economy began to recover, the new increases in fruit supplies to Dar es Salaam had

no other option than to by pass the already overcrowded Kariakoo and go directly to the retail markets.

Table 4.4 Annual Grouped Deflated Prices per Metric Tonne (TShs) and Percentage Annual Changes

Year	Tomatoes	%	Vegetables	%	Citrus	%	Fruit	%
1981	26,083		18,907		10,089		19,633	
1982	30,122	*15.49*	20,817	*10.10*	13,224	*31.07*	28,173	*43.50*
1983	29,026	*-3.64*	28,434	*36.59*	17,216	*30.19*	30,772	*9.23*
1984	22,594	*-22.16*	21,296	*-25.10*	10,610	*-38.37*	27,162	*-11.73*
1985	21,842	*-3.33*	20,614	*-3.20*	10,251	*-3.38*	28,807	*6.06*
1986	21,826	*-0.07*	26,139	*26.80*	11,116	*8.44*	26,456	*-8.16*
1987	31,551	*44.56*	45,226	*73.02*	15,974	*43.70*	30,638	*15.81*
1988	49,768	*57.74*	59,009	*30.48*	15,261	*-4.46*	44,785	*46.17*
Total	23,685	*90.81*	40,102	*212.10*	5,172	*51.26*	25,152	*128.11*

Source: Author's Survey

The deliveries of fruit and vegetables at Kariakoo appear to have reached their peak by about 1983 after which time it remained at around the same level or a little less. During the following three years, the deliveries of both categories of fruit declined significantly, by up to 60 per cent per annum in citrus fruits and 34.8 per cent in the other fruit category. The deliveries of vegetables, however, continued to increase, albeit more slowly, between 1983 and 1987 when the country's economic crisis was at its height. Currently, during a period of economic liberalisation, those delivering fruit are finding Kariakoo market more crowded than ever and dominated by vegetables. In order to sell quickly, while the fruit are still in good condition, and to avoid the congestion and tax involved in Kariakoo, it is easy to understand why an increasing amount of fruit does not enter the Dar es Salaam market through Kariakoo.

Figure 4.37 Mean Price per Metric Tonne of the main Grouped Fruit and Vegetable Categories

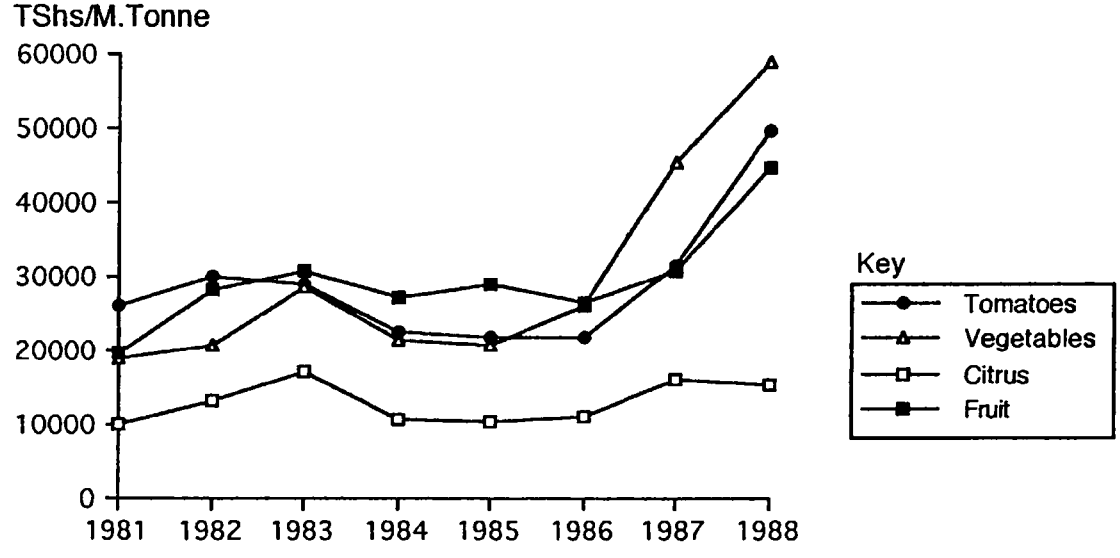
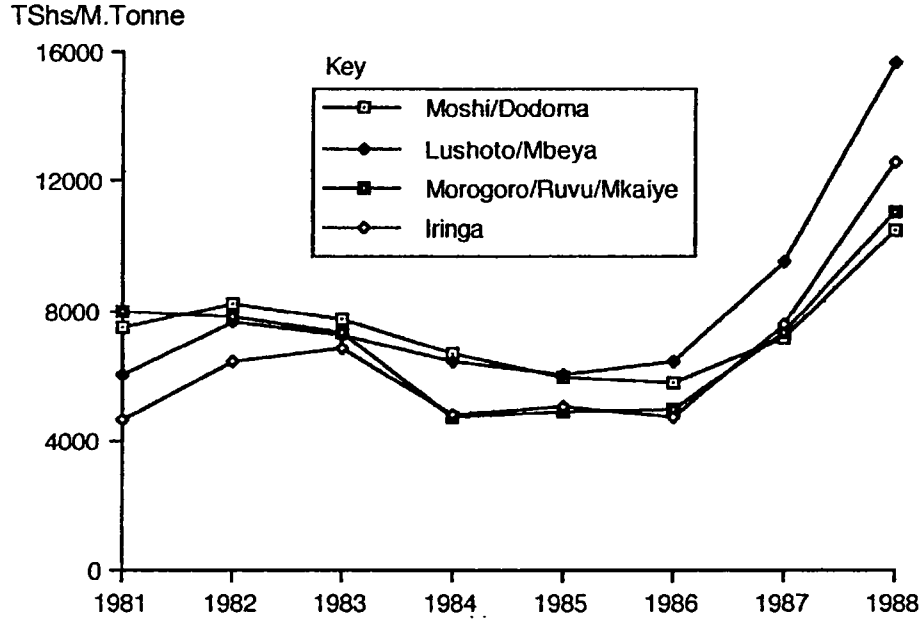


Figure 4.37 gives overall variations in real prices among the commodity groups over the survey period. All commodity groups saw an increase in mean price per metric tonne between 1981 and 1983, except tomatoes, which began to decline in price in 1982. (See Table 4.4) In 1984 all the commodity groups declined in price by between 11.73 per cent, in the case of fruit, and 38.37 per cent, in the case of citrus fruit prices. In 1985 all the grouped commodity group prices declined by around 3.3 per cent, except fruit which increased by 6.06 per cent. The 1987 to 1988 period has resulted in a significant increase in price for all the commodity groups ranging from 15.81 per cent for fruit to 73.02 per cent for vegetables. By the end of the period vegetables emerge have increased by the largest proportion, rising from TShs 18,907 to 59,009 at 1981 prices, a net increase of 212.10 per cent or 30.3 per cent per annum. The fruit group increased from TShs 19,633 to 44,785, a net increase of 128.11 per cent or 18.30 per cent per annum (Table 4.4). The pattern over the period appears to be one of interrupted increase, with the prices on the whole increasing up to 1983, when the Kariakoo wholesale market reaches more its ceiling capacity of around 70,000 metric tonnes of deliveries, and when the Tanzanian economy reached its lowest point, in terms of the availability of goods in markets and shops. The group price then declined in 1984, levelling off in 1985 and 1986, before increasing again in the last two years of the period.

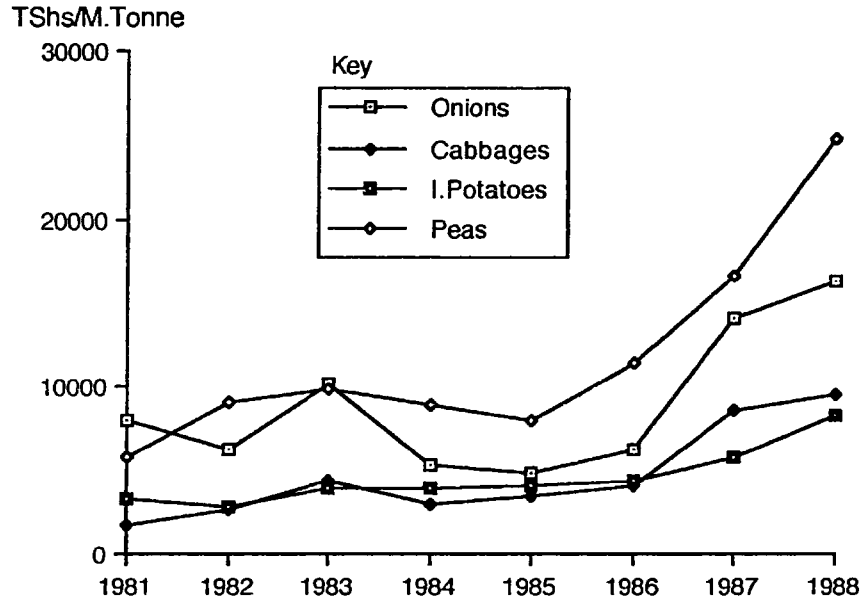
Figure 4.38 Annual Mean Price per Metric Tonne of Tomatoes



The price per metric tonne data for tomatoes is graphed in Figure 4.38. This shows a consistent increase in price over the period for all tomatoes, ranging from a net increase of 39.1 per cent for tomatoes from Morogoro, Ruvu and Mkaiye, to 170.6 per cent for tomatoes from Iringa. Tomato prices increase from 1981 to 1982 in all cases, except for tomatoes from Morogoro, Ruvu and Mkaiye, which decline consistently right up to 1984. Reports from inhabitants of Dar es Salaam suggested that a considerable amount of illegal trading of vegetables from Morogoro took place in the early 1980s. On a number of occasions the food supply in Dar es

Salaam was extremely low. Some inhabitants collectively hired a vehicle of some sort, preferably a pick-up and under cover of night took a trip to producing areas in order to purchase food for their household. This involved taking the risk of being caught at police roadblocks and charged with black market trading, and so the nearest producing areas such as Morogoro were the obvious targets of such enterprises. This had a depressing impact on the price of tomatoes and other commodities from these areas, because of this additional outlet for the producers. After 1982 tomatoes from Moshi and Dodoma and Lushoto and Mbeya declined in price until 1986 in the first case and 1985 in the second, both increasing after this to end the period 40.5 and 159.8 per cent higher than the 1981 price at 1981 values.

Figure 4.39 Annual Mean Price of Vegetables at Kariakoo

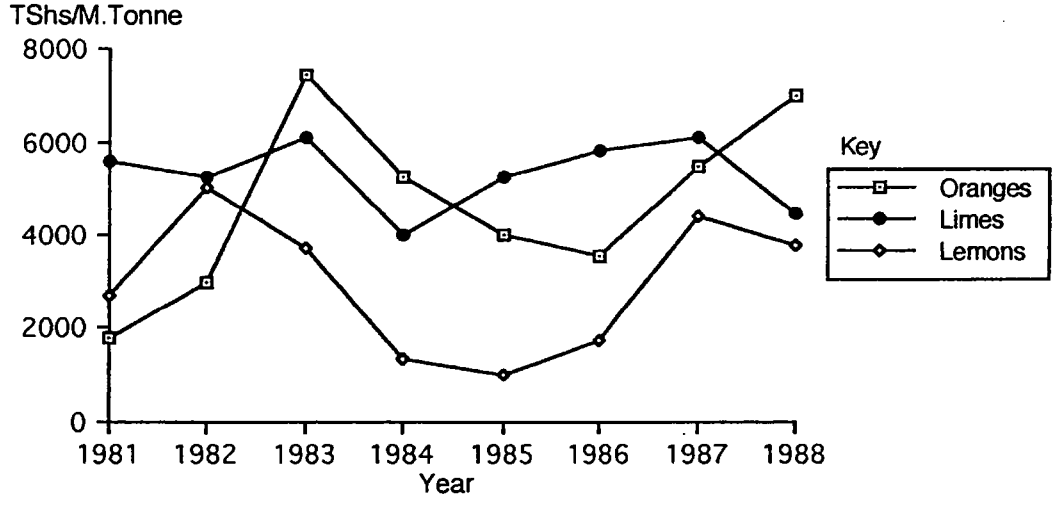


With regard to vegetable prices, the first two years of the 1981-87 period are characterised by a decline in the real price for onions and Irish potatoes and increased prices for cabbages and peas (Figure 4.39). 1982 to 1983 sees real increases in the prices of all the commodities, greatest in onions, rising from a mean of TShs 6,209 to TShs 10,211 (up 64 per cent), and least in pea prices, rising from TShs 9,099 to only TShs 9,870 (up 8 per cent). After this increase, Irish potato prices continued increasing in real terms to reach TShs 8,348 in 1988 from TShs 3,356 in 1981, a net increase of 148.8 per cent at 1981 values. Figure 4.39 shows similarities with the upward trend interrupted in the middle of the period as shown in the graph of tomato prices (Figure 4.39), particularly in the case of peas and cabbage. The net increases over the period are far greater in the vegetable group than in the tomato group, however. The net increases in real price estimates range from 103.0 per cent for onions to 472.4 per cent for cabbages. The surprisingly low price estimates achieved for the peas may be explained by the fact that this commodity included pigeon peas and green peas, both of which have quite different prices and values. Pigeon peas are usually dried and sold throughout the year. Green peas are sold fresh and have a distinct season focused around July and August. Peas are the most

expensive vegetable in six of the eight years reviewed, exceeded only by cabbages in 1981 and 1983. This vegetable emerges in the last two years of the period as the most expensive of the sixteen commodities reviewed, sharing this position with only cabbage and pineapples.

Figure 4.40 graphs the mean annual price per tonne of the citrus fruits. One of the notable features of this graph is the remarkable drop in price of lemons in 1985 to the lowest of the survey period. Similar declines are recorded for the other two commodities in the middle of the period under review, in 1984 for limes and in 1986 for oranges. The supply of oranges, as described in section two of this chapter, is in decline at Kariakoo (see Table 4.1), as are the deliveries of lemons. This appears to have influenced the net increase in the price of these two commodities, by 283.0 per cent in the case of oranges and 41.7 per cent in the case of lemons. Limes, on the other hand, increased in supply to Kariakoo (see Table 4.1) and this apparently influenced the 19.8 per cent net decline in price over the period, the only commodity reviewed to decline in real price over the period. The greatest decline in the real price of limes occurred in 1984 falling by TShs 2,078 to TShs 4,009, or 34 per cent, from the previous year, coinciding with the peak volume of delivery year for limes, when a record of 555 metric tonnes were delivered, over twice the nearest annual delivery recorded over the period (see Table 4.1). The reason for this may lie in the fact, already referred to, that limes are consumed alongside vegetables as a garnish for main meals.

Figure 4.40 Annual Mean Citrus Fruit Price per Metric Tonne at Kariakoo

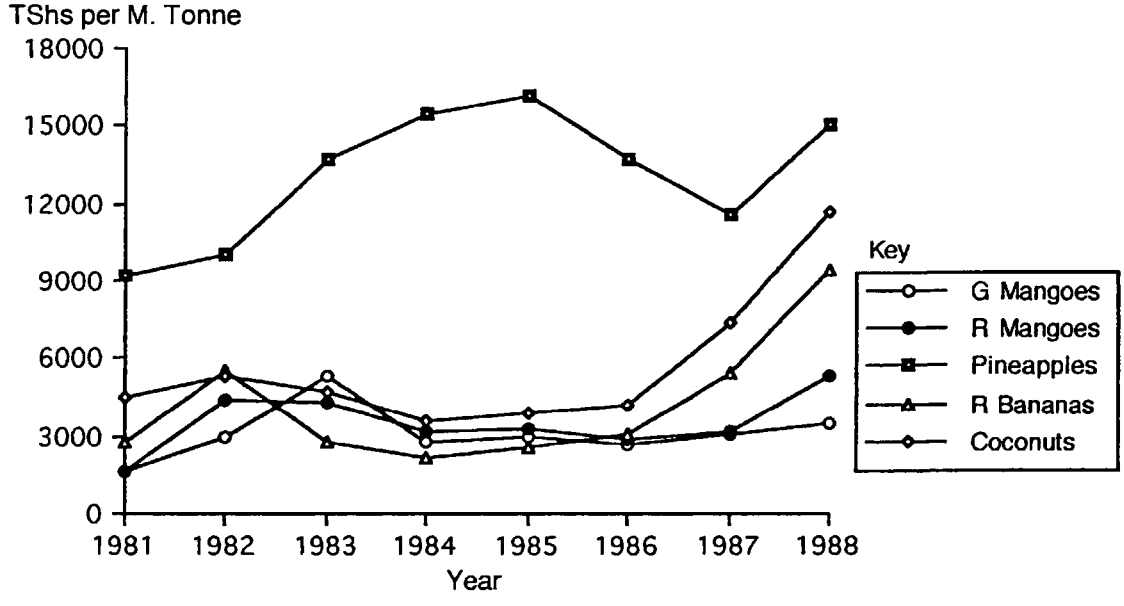


The mean annual prices per tonne for other fruit are graphed in Figure 4.41. The first two years are characterised, as in each of the other commodity groups, by an increase in each of the commodities. This is followed in 1983 by pineapples and green mangoes increasing in value, while the other three decline. In 1984, all the fruits, except pineapples decline in real price, followed by a modest increase in real prices for all the commodities in 1985. Both ripe and green mangoes decline in price in 1986, while ripe bananas and coconuts increased in price. This may be explained, at least in part, by the increase in the volume of supply of the former

two fruits in contrast to the decrease in supply of the latter two. In this year and the following year pineapples declined in real price. The exceptional pattern of the pineapple real price changes may be partly explained by the pattern of the volume of delivery. The first five years of the period see a decline in the volume of pineapple deliveries at Kariakoo, which peaks in 1985 (see Figure 4.9), the same year as the peak price per metric tonne. The following year, 1986, sees an increase in the supply of pineapples for the first time in the period, and a consequent decrease in the price for the first time. In the last two years of the period only pineapples record a decline in price in 1987. This is more than made up for by the recovery of the price to TShs 15,059, above its 1986 level. The initial increases in the pineapple price may have been the result of the sharp decline in supplies in 1984 and 1985, delaying the decline in rice for two or three years. It may also have been partly influenced by the export market. Pineapples are the only commodity, of those examined in this analysis, which Tanzania exports in any great quantity.

Finally, ripe bananas and coconuts follow a very similar pattern both in terms of price and in terms of annual change. Both begin with a rise in price to 1983, both fall in price in 1985 and then rise sharply to 1988, before falling in 1989. Coconuts began the period at a higher price of TShs 4,500 remained at a higher price than bananas, before and falling by TShs 17,000 between 1988 and 1989. In contrast, bananas began at a price of TShs 2,700 and ended at TShs 16,000 after falling only TShs 8,000 in from TShs 24,000 in 1988 to TShs 16,000. Bananas experienced a net increase of 488 per cent. This dramatic drop in price during the final year resulted in coconuts having the lowest net increase over the survey period at 132 per cent.

Figure 4.41 Annual Mean Fruit Price per Metric Tonne at Kariakoo



This section has demonstrated that the data representing the value of deliveries to Kariakoo Wholesale Market mirror those of the volume of deliveries. This confirms the increasing

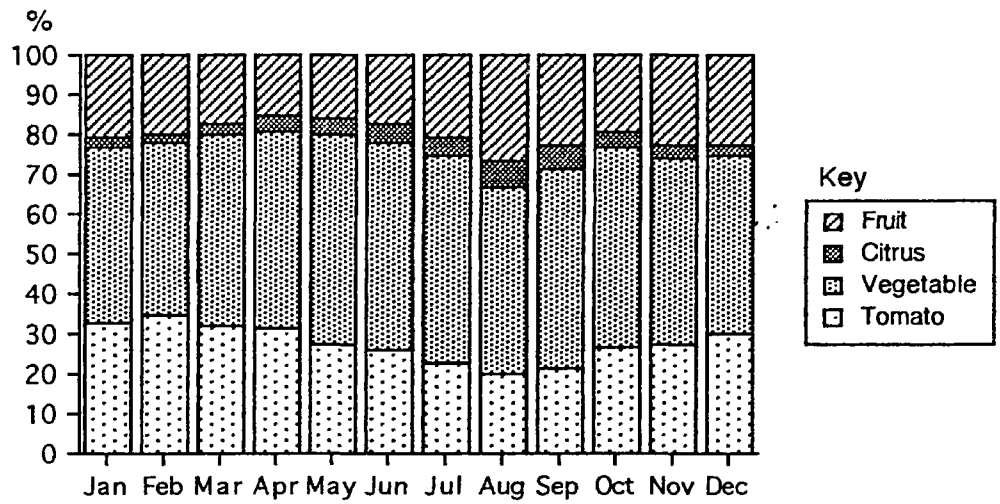
importance of vegetables over fruit in the market. Within the four main categories, the value of tomatoes, from Lushoto and Mbeya increased in importance over those from other origins, particularly after 1983. In the vegetable group the value of Irish potato deliveries increased over the period making this crop account for over 50 per cent of annual vegetable value. This may be because of the Irish demand for traditional staple foods, which some consumers may abandon in favour of potatoes, if they consider them to be cheaper or more convenient. The value of oranges deliveries dominates the citrus fruit, but lemons decline over the period in favour of limes. Finally, the value of coconut deliveries has declined over the period in favour of sweet bananas. The value of deliveries of the fruit commodities increased in relative importance until 1985, but subsequently declined as the absolute values of coconuts and sweet bananas increased again. The mean annual real price of all commodities except pineapples declined in the mid 1980s, as the Tanzanian economy reached the height of its crisis. As the economy has recovered, towards the late 1980s, so the real prices of the commodities examined have increased again.

4.6 Monthly Value and Price of Deliveries to Kariakoo

The mean value of monthly deliveries for each of the commodity groups is presented in Figure 4.42. The vegetable group accounts for a large proportion of the value of fruit and vegetables delivered to Kariakoo, ranging from 43.8 per cent in February to 52.6 per cent May. The lowest proportion coincides with the lowest value of monthly deliveries at TShs 10.2 million in February. The highest proportion coincides with a value of TShs 13.4 million in May. After reaching this mean monthly value in May, there is a decline of 6.8 per cent , to TShs 12.5 million in June, before increasing once more by 9.9 per cent to TShs 13.7 million in July. The end of the dry season, in August, sees the value fall by 21.0 per cent to TShs 10.8 million, after which the mean monthly value climbs steadily to reach TShs 12.6 million in December. A rise of 16.7 per cent over four months is facilitated by the easier transport conditions during the December to February dry season and encouraged by the increased demand during the Christmas holiday.

The next most important commodity group by value is the tomato group (Figure 4.42). This group averages a proportion of 27.7 per cent of the overall mean monthly value of deliveries, ranging from 20.1 per cent in August to 35.5 per cent in February. The month of the lowest proportion of overall value coincides with the month of lowest mean monthly value, August, recording a value of TShs 4.7 million, after which the volume of deliveries of tomatoes began to rise to its peak in October. Although February also records a high mean monthly value, the highest is recorded in December at TShs 8.4 million, at the peak of the short, intense dry season, when tomato deliveries are beginning to decline once more.

Figure 4.42 Percentage Profile of Mean Monthly Value of Fruit and Vegetable Group Deliveries at Kariakoo



The deliveries of citrus and other fruit categories are influenced to a much greater extent by the importance of the environment and the climatic seasons. The majority of the fruit crops are perennial plants harvested at certain periods of the year, with the notable exceptions of coconut, banana and paw paw trees, which produce fruit at any time of the year. In the case of the vegetable crops, their fruit come from annual plants, which, in most parts of Tanzania may be planted at any time of the year, given suitable environmental conditions, such as the availability of water during the dry season for irrigation, and the accessibility of inputs, such as fungicides to protect the plants from fungi, particularly prevalent during the rainy seasons. However, fruit trees in all parts of Tanzania do not necessarily produce fruit at the same period of the year, and evidence from interviews and some reports (Seminar für Landwirtschaftliche Entwicklung, 1986; Mascarenhas and Mbilinyi 1971) suggest that orange trees in different areas of Tanzania supply the city of Dar es Salaam at different periods of the year. For example, oranges from Morogoro and Tanga Regions, the main supply regions for Dar es Salaam, are mainly delivered between April and July, while the area of Kilwa in Lindi Region (see Map 4.1) mainly supplies between July and September and the area around Dar es Salaam, Coast Region, supplies the city throughout the year. In the case of those supply areas which are at some distance from the city the supply may be almost as much influenced by the conditions of the roads as by the actually size of the harvest available for the city.

The fruit category accounts for a monthly mean proportion of 20.1 per cent , ranging from 15.6 per cent in April, at the centre of the main rainy season, to 26.7 per cent at the of the long dry season. There is a secondary peak in the proportion of value in December, during the shorter dry season, but this accounts for the highest mean monthly value at TShs 6.4 million. August records TShs 6.2 million, while April also records the lowest mean monthly value at TShs 4.0 million.

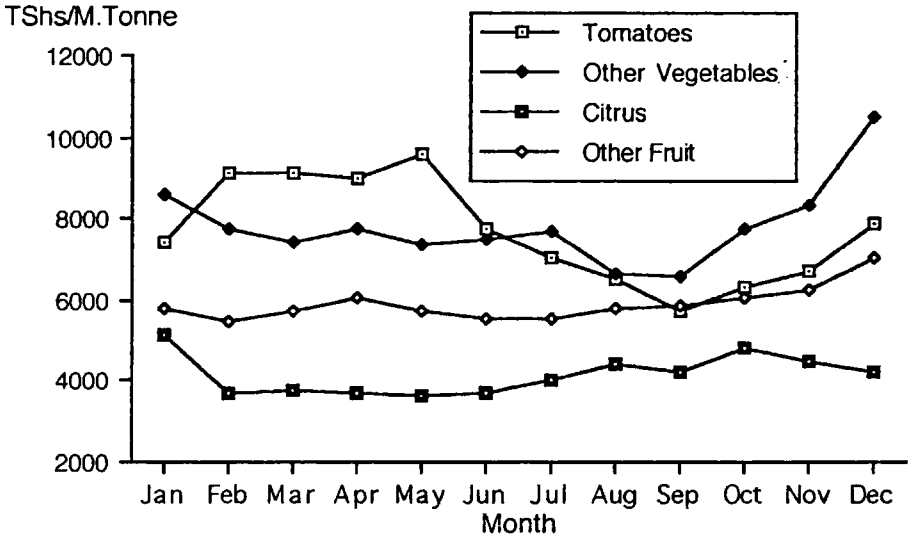
The citrus fruit category accounts for the smallest proportion of mean monthly value. On average, it accounts for 4.0 per cent of overall value of deliveries, but never more than 7 per cent. It records less than 1.8 per cent of overall value in February, when only TShs 0.4 million worth of citrus fruit is delivered at Kariakoo. The period of peak citrus fruit supply occurs during the months of August and September at the end of the long dry season, when a mean of just over TShs 1.5 million worth of citrus fruits were delivered at Kariakoo. This coincides with a rise in the peak of the orange deliveries which dominates the citrus category, and the rising supply of lime and lemon deliveries, all combining to produce a high volume of citrus fruits at this time of year.

Throughout the year the proportion of total value of fruit and vegetable deliveries accounted for by tomatoes to Kariakoo appears to have an annual cycle. The value begins in February at a high level, when the value of fruit and vegetable deliveries is relatively low, but the value of tomato deliveries is relatively high, and it it low in August, when the value of fruit and vegetables is low, but the value of tomatoes is also low. In the case of vegetables the cycle peaks in May, when the value of vegetable deliveries is at its highest, and troughs in January and February, when it is at its lowest. Citrus fruits peak in August and trough in February, during the heaviest rainy season, when such fruits are in low demand, and the difficulties of transport are at their greatest. Finally, the proportion of value accounted for by fruit peaks in August, at the end of the long dry season, when supplies are relatively high, and troughs in October and February, during the two rainy seasons. The highest mean monthly value of deliveries occurs in December at the height of the main dry season in December. These highly variable supplies of fruit and vegetables have clear implications for the consumers. In periods of peak supply there is an abundance of commodities at reasonable prices, but only the more affluent households have the facility to purchase the more perishable crops and store them in order to avoid either paying the high prices or the commodity shortages during periods of low supply. The corollary of this is that during the rainy season, when traders have difficulty in getting supplies to the city because of the poor condition of the roads, or, during periods when most crops are not being harvested, the poorer sections of Dar es Salaam's population either have to pay high prices or, more likely go without such basic vegetables as onions. They have to rely instead on monotonous diets of staples, occasionally supplemented with beans or other foods which are less perishable or which can be dried.

Mean monthly prices per metric tonne of each of the selected commodities were calculated by the author from the volume and the value data. It should be noted, however, that, when examining these data the volume in tonnes are generally the result of estimates made by KMC staff and the value is calculated on this basis using KMC-set minimum guide-line prices. These guide-lines are arrived at through the procedure explained in Chapter Three. The results of this section, therefore, represent an indication of the monthly pricing patterns, and are not intended as accurate presentations of the actual prices paid to Kariakoo's suppliers. In addition, it should be remembered that the minimum guide-line prices are set by KMC on a weekly basis. This

rules out the use of the data for the analysis of daily variations in price and value of the commodities examined. A more detailed survey of daily transactions would be required in order to facilitate such an analysis.

Figure 4.43 The Grouped Mean Monthly Fruit and Vegetable Prices



The mean monthly price per metric tonne of the commodity groups at constant 1981 prices, graphed in Figure 4.43, shows general trends. Firstly, the mean tomato price climbs steadily from TShs 7,457 per metric tonne in January up to the highest mean monthly price of TShs 9,562 in May, a rise of 28.2 per cent over four months. This highest price in May is likely to be the result of high demand and the low, or infrequent, supply due to the transport difficulties in the heavy rainy season which ends in early May. This is followed by a decrease to the minimum in September, at approximately TShs 5,733, a decline of 40.0 per cent over four months. A mean monthly price of around TShs 6,000 is maintained during the short rainy season in October and November , before climbing again to TShs 7,876 in December.

Table 4.5 The Proportion of Monthly Variation in Prices for the Main Commodity Groups

Month	Tomatoes	Vegetables	Citrus	Fruit
January[1]	-5.31	-19.02	20.88	-18.10
February	22.73	-9.51	27.77	-5.37
March	-0.37	-4.65	2.06	5.00
April	-1.43	4.41	-1.19	5.31
May	6.39	-5.05	-2.34	-5.08
June	-19.00	1.64	2.54	-3.88
July	-8.90	2.93	7.34	0.85
August	-8.09	-13.25	10.46	4.69
September	-11.59	-0.96	-3.75	0.69
October	9.68	17.53	13.41	3.51
November	6.51	7.65	-7.35	2.93
December	17.59	25.39	-5.45	12.96

1 The figure quoted for January represents the proportion of difference between the price in December and that in January

Source: Author's calculations

The mean monthly price for vegetables is relatively more stable. It begins the year at TShs 8,583 in January, falling by 14.2 per cent over the next two months to TShs 7,406 in March. A mean monthly price of around TShs 7,500 is more or less maintained over the next four months, before a fall in price of 13.25 per cent to TShs 6,663 in August (see Table 4.5), and then to TShs 6,566 in September. The last three month are characterised by a 58.6 per cent increase in the price from September to December, when the peak mean monthly grouped price is achieved at TShs 10,470.

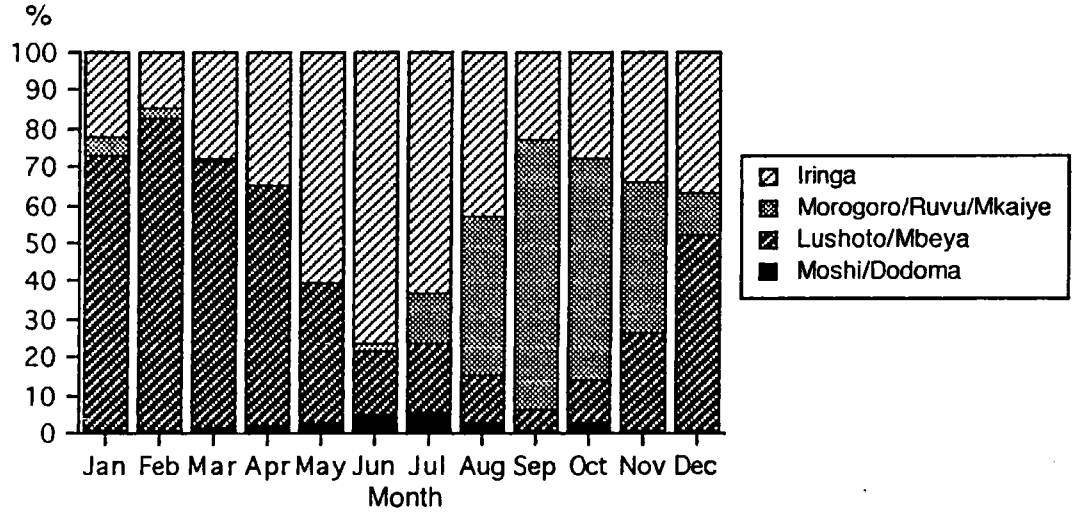
The citrus fruit price begins the year with the highest mean monthly price at TShs 5,108. It declines by 27.8 per cent, as the rainy season begins in February and demand for these fruits declines. It maintains a price of between TShs 3,500-4,000 during the period of high delivery, when the main supply areas are in their harvesting season. The price increases by 10.5 per cent to TShs 4,418 in August, as supplies from the main supply regions of Tanga and Morogoro begin to decline. However, there is a slight decline of 3.75 per cent in September to TShs 4,252. Interviews with Kariakoo Market staff suggest that this modest decline in September is the result of supplies from the increasingly important citrus producing area of Kilwa in Lindi Region, south of Dar es Salaam. The deliveries from this area are not yet as important as those from Tanga or Morogoro, but oranges from Kilwa are considered among the staff and traders at Kariakoo to be among the sweetest to arrive there. According to Kariakoo market staff, peak deliveries from this area occur in September, just before the rainy season. The roads from the south of the country to Dar es Salaam are particularly badly affected by the rains, and so the supplies from this area are severely limited by their ability to get through to the city. The decline in price may be the result of the lime and lemon fruits reaching the peak of their deliveries in September and their prices falling from the previous month by 8.7 and 11.9 per cent respectively. By October,at the height of the lesser rainy season, the price of citrus fruits has already risen again to TShs 4,823 . This rise may have been influenced by the rise in price of the lime and lemon deliveries of 23.1 and 28.0 per cent respectively, as these two fruit begin to decline in from their peak months of volume of deliveries.However, the price in November and December declines once more by 7.4 per cent to TShs 4,468 and then by 5.5 per cent to falling back to around TShs 4,225. This time however the decline in price is likely to be influenced by the increased supply of limes and the diversion of demand for a sweet, juicy fruit from oranges to the massively increased supply of ripe mangoes which occurs at this time.

Fruit appears to have the most stable grouped mean monthly price at no less than TShs 5,400 and no more than 7,000. The pattern is one of a gradual increase throughout the year, from the lowest point in February, 5.4 per cent down on the January price, at TShs 5,452, to the highest point in December at TShs 7,034, a rise of 29.0 per cent over 11 months.price in December at TShs 7,034 July to the maximum in November. This increase is followed by a gradual decline (December records almost the same price as July) over two or three months, and a period of relative stability, until a drop in price from June to the minimum in July.

Each of the commodity groups, except citrus fruit, has a marked price increase from November to December. This may be explained by an increase in purchases as people buy food to celebrate first Independence Day on the 12th December, and secondly Christmas. The lack of increase at the same time in fruit may perhaps be explained by the onset of the ripe mango season. As the temperature in Dar es Salaam increases during the hottest months of the year, when temperatures frequently exceed 30°C, the demand for a thirst quenching snack increases. Although the mean deliveries of oranges declined to around 200 metric tonnes from a peak of 400 metric tonnes earlier in the year, the supply of ripe mangoes increased from a mean of under 5 metric tonnes in August to over 200 between October and December, reaching as high as 373 metric tonnes in November (see Appendix 4.2).

Figure 4.44 is a graph of the mean monthly proportions of the value of tomato deliveries from the four main source groups to Kariakoo. This bears a striking similarity to the graph in Figure 4.13, which displays the proportion of volume of tomato deliveries: the pattern of tomato value and tomato deliveries are very similar, in terms of seasonal variation. The total monthly value of tomatoes, as in the case of the tomato volume, varies much less than each of the tomato groups, ranging from just over TShs 4.7 million to just under TShs 8.4 million . This results in a coefficient of variation of 18.25. However, the seasons of each of the tomato types is very clear and the variation in mean monthly value of the deliveries of each type has a much larger range. Tomatoes from Iringa and Moshi/Dodoma peak in June at about 70 and 6 per cent of the total tomato market value respectively; tomatoes from Morogoro/Ruvu/Mkaiye peak in September at about 70 per cent; and tomatoes from Lushoto/Mbeya peak in February at about 80 per cent. The implications confirm the conclusion of the examination of the data concerning the volume of tomato supply that, in spite of the marked seasonal variations in supply, the traders in Tanzania have been able to ensure a relatively stable supply of tomatoes to the city of Dar es Salaam.

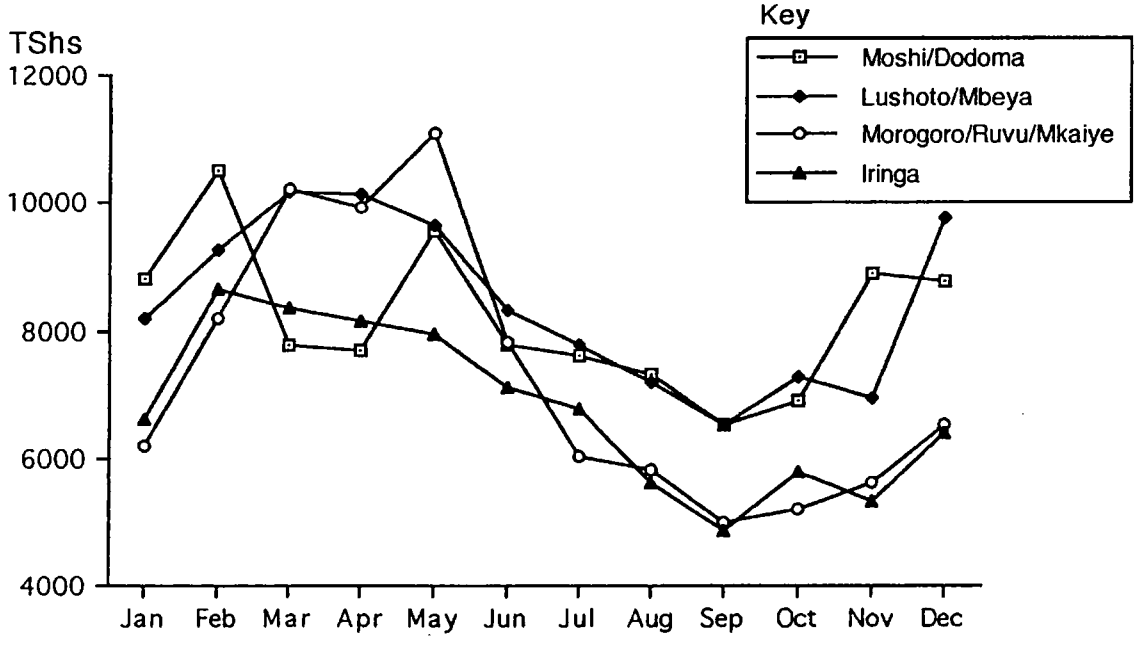
Figure 4.44 Percentage Profile of Mean Monthly Value of Tomato Deliveries at Kariakoo



The most notable impression from Figure 4.45 is the highly variable price of each tomato type throughout the year. Tomatoes from Moshi and Dodoma begin the year at about TShs 8,800, and increase by 19.4 per cent to TShs 10,528 in February. A similar pattern is evident for the other tomato groups . Tomatoes from Lushoto and Mbeya increase by 12.8 per cent from TShs 8,202 to TShs 9,248. Tomatoes from Morogoro, Ruvu and Mkaiye increase by 31.9 per cent from TShs 6,214 to TShs 8,198. Tomatoes from Iringa increase by 30.9 per cent from TShs 6,596 to TShs 8,637. Only tomatoes from Lushoto and Mbeya and tomatoes from Morogoro, Ruvu and Mkaiye continue this upward trend. In the case of the former, the price increases by a further 9.9 per cent and in the case of the latter the price increases by a further 24.4 per cent. The likely reason for these sharp increases in price is the general downward trend of the overall volume of tomato deliveries in the first four months of the year (see Figure 4.12). The variation in price between March and April is generally downward, but by a less extreme factor. In the case of tomatoes from Lushoto and Mbeya, the price decreases by 0.2 per cent, while at the other extreme the tomatoes from Morogoro, Ruvu and Mkaiye decrease by 2.6 per cent.

Interestingly, the month of May divides the four tomato groups into two trends, once more, as tomatoes from Morogoro, Ruvu and Mkaiye and from Moshi and Dodoma increase in price by 23.9 and 11.8 per cent, respectively, to prices of TShs 9,551 and TShs 11,112. Meanwhile, tomatoes from Lushoto and Mbeya and Iringa decline in price by 4.9 per cent and 2.7 per cent respectively. The likely reason for these declines are in the case of Lushoto and Mbeya, the deliveries of tomatoes are declining in this month, but the demand shifts to the increasing volume of tomatoes being delivered from Iringa and, to a lesser extent, from Moshi and Dodoma.

Figure 4.45 Mean Monthly Price per Metric Tonne of Tomatoes Delivered at Kariakoo (at constant 1981 prices)



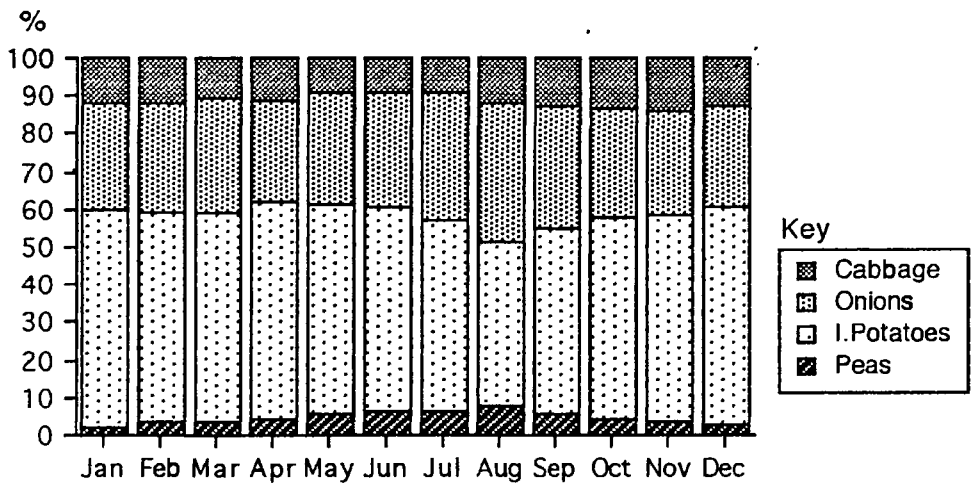
Over the following two or three months there is a small increase in the overall volume of tomatoes delivered to Kariakoo, the result of the easier transport conditions during the long dry season. This results in a rapid decline in the mean monthly decline in the price of all tomato groups from May through to September. The factor of this decline varies from the smallest in the case of Moshi and Dodoma, where the price declined by 313.4 per cent from TShs 9,551 to TShs 6,546. The highest decline in price during this part of the year occurred in the tomatoes from Ruvu and Mkaiye, where the tomato price declined from TShs 11,102 by 55.2 per cent to TShs 4,975. This latter group reached a peak of 696.8 metric tonnes in September, contributing to the higher downward trend of the price of tomatoes from this group. With the onset of the rainy season in October, the price of all the tomato groups increases by between 4.4 per cent in the case of Morogoro, Ruvu and Mkaiye and 19.1 per cent in the case of Iringa. In the first case, tomatoes from Morogoro, Ruvu and Mkaiye are at their highest mean monthly delivery, with 769 metric tonnes, and in the case of Iringa, in October the supply begins to increase for its second wave of supply, which peaks in December (see Figure 4.12). In each case the trend for the last three to four months of the year is upwards, the only exception being the price for tomatoes from Moshi and Dodoma, which declines by 1.3 per cent. This is likely to be the result of a modest increase in the volume of delivery of tomatoes from this area from from 9.5 metric tonnes to 14.8 metric tonnes.

In summary, the year can be divided into three main parts. The first can be characterised as a period of high price, of varying degrees. This extends into May, when after the end of the short, but intense rainy season, the prices enter the second part of the year, characterised by declining prices. This decline continues through the long dry season to reach the month of September. The final part of the year is characterised by rapidly increasing prices, initially brought on by the onset of the rainy season, but this is later sustained by the increased demand at the time of the Christmas holiday.

The proportions of value of deliveries of vegetables are far more stable as can be seen in Figure 4.46, although there are two exceptions in the pattern of mean monthly values. These occur in March and August, at which times the total onion value increases, whilst the value of potatoes, which accounts for an average of 62.9 per cent of the mean monthly volume of vegetable deliveries, and a mean monthly value of delivery of 53.9 per cent , decreases to account for 55.5 per cent of the overall vegetable delivery and 43.7 per cent of the overall vegetables delivery value. Figure 4.15, graphing the absolute volume of deliveries arriving at Kariakoo, shows that in August the mean potato delivery in metric tonnes is at its lowest level. In Figure 4.47, it is clear that the August value of potato deliveries achieves its lowest point, the value of potato deliveries declines to TShs 4.7 million in August, from the highest value of TShs 7.4 million in May, a decline of 36 per cent over three months. Meanwhile deliveries of onions rose to a mean monthly volume of 470 metric tonnes, which is achieved in both August and September. The August delivery, however, accounts for 25.0 per cent of the overall mean vegetable delivery for that month, whereas September accounts for only 22.7 per cent. The

value of onion deliveries reached its highest point in July at TShs 0.9 million, but by August the value of onion deliveries is still TShs 0.8 million.

Figure 4.46 Percentage Profile of Mean Monthly Value of Vegetable Group Deliveries at Kariakoo



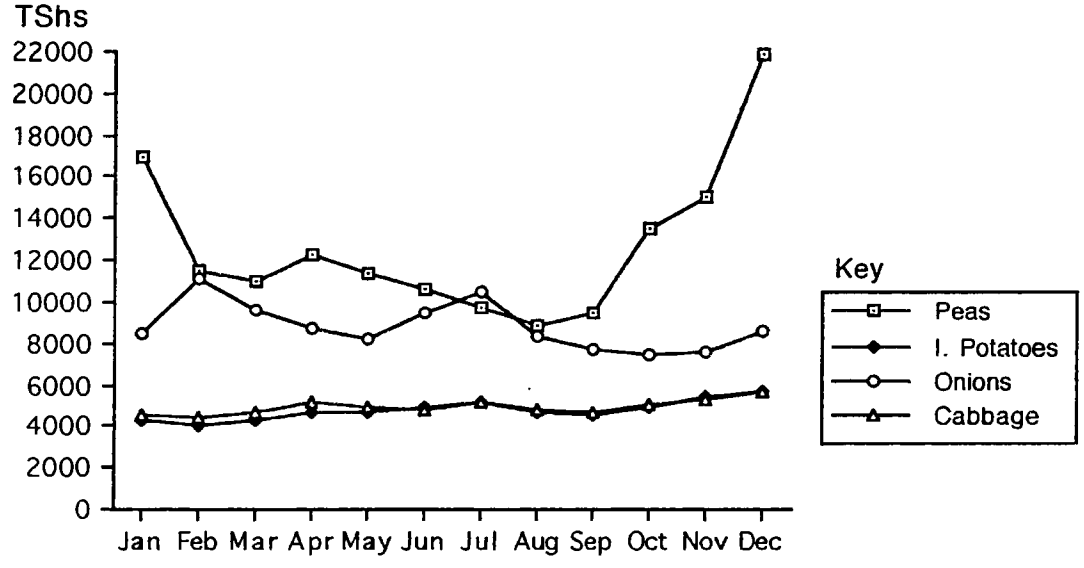
The value of cabbage deliveries has a pattern which falls into four main parts. The first part begins the year in January at TShs 1.3 million and declines 5.94 per cent to TShs 1.2 February. This is followed by an increase in value over the next two months, reaching TShs 1.4 million, an increase of 16.7 per cent, in April. This increase in value is most likely to be the result of the increase in the price of cabbages paid over these initial few months of the year during the intense rainy season. Evidence, collected during field visits to the producing areas, suggests that some of the areas which produce cabbages, (for example, Mgeta Division of Morogoro Region), is particularly badly affected by the onset of the rains. This reduces the frequency of cabbage deliveries at this time of year, and appears to have had the effect of increasing the price. This has the knock-on effect of increasing the value of deliveries at Kariakoo. However, the value of deliveries of other vegetable commodities also increases at this time, particularly peas and Irish potatoes. This has the effect of producing a general pattern of the proportion of overall vegetable value accounted for by cabbage, to decline from January, when it accounts for 12.2 per cent through to June,when it accounts for 8.9 per cent of the value of vegetable deliveries. The only exception to this occurs in April, when cabbage deliveries rise to account for 11.0 per cent of vegetable value.

After June, the proportion accounted for by cabbage increases steadily to November, when it accounts for its highest proportion of 14.2 per cent. This coincides with the highest mean monthly value of deliveries of TShs 1.6 million. Once more, as a result of evidence collected in the field, the peak months of supply of cabbages from one of the most important production areas, Mgeta Division, in Morogoro Region, begin in August and go through to December, with the only likely interruption being the effect of the rains on the transportation. This is borne out by the fact that towards the end of the long dry season, the volume of deliveries increases to

the highest mean monthly volume of cabbage deliveries at 310.6 metric tonnes, in October. The price for cabbage increases towards the end of the main cabbage harvesting season, such that the high value of cabbage deliveries are sustained at TShs 1.6 million for the last three months of the year.

Peas maintain a relatively low value throughout the year, beginning the year in January at 2.7 per cent of vegetable values, this rises through to August when it reaches its peak at 7.7 per cent, coinciding with the decline of the peak of the value of deliveries of peas at Kariakoo in July TShs 0.9 million and coinciding withe the highest mean monthly volume of deliveries in August at 97.1 metric tonnes.

Figure 4.47 Mean Monthly Price per Metric Tonne of Vegetables Delivered at Kariakoo (held at 1981 values)



Vegetable monthly prices, shown in Figure 4.47, are relatively low and stable throughout the year, with the striking exception of the price per metric tonne for peas. Peas begin the year in January at TShs 16,963 per tonne. This is followed by a fall of 32.3 per cent to February at TShs 11,4849, a level which is more or less maintained, until June, when a small downward trend until August, takes the price down to TShs 8,899. After the lowest mean monthly price per metric tonne for peas is recorded in August,when the largest mean monthly delivery is also recorded, there then begins a sharp increase to more than double the price in the next three months, reaching TShs 21,918 per tonne in December,when the lowest volume of delivery is recorded at 13.5 metric tonnes, or 0.8 per cent of the vegetable delivery, an increase of 146.3 per cent over four months. The sharp changes in price for peas may make the variations in other crops in Figure 4.47 seem relatively less important, although cabbages and potatoes do maintain a relatively stable price throughout the year,ranging from TShs 4,000 to 5,700 and from TShs 4,400 to TShs 5,700 respectively. Cabbages tend to have a higher price per tonne than potatoes, although their prices converge in the last two months of the year.

Onions are midway between the two extremes, beginning the year at just over TShs 8,523, followed by the highest mean monthly onion price of TShs 11,128. This is then followed by a three month decline of 25.6 per cent to TShs 8,276 in May, and a two-month increase of 27.5 per cent to July at TShs 10,556. After July, the price declines to about TShs 7,500 until a modest increase is recorded from TShs 7,633 to TShs 8,597 in December, an increase of 12.0 per cent. A comparison with the graph of volumes in Figure 4.15 shows that the troughs of price in May and September, at the beginning and end of the long dry season, coincide with peaks in the volume of onions supplied at 434.8 and 470.3 metric tonnes.

Figure 4.48 Percentage Profile of Mean Monthly Value of Citrus Deliveries at Kariakoo

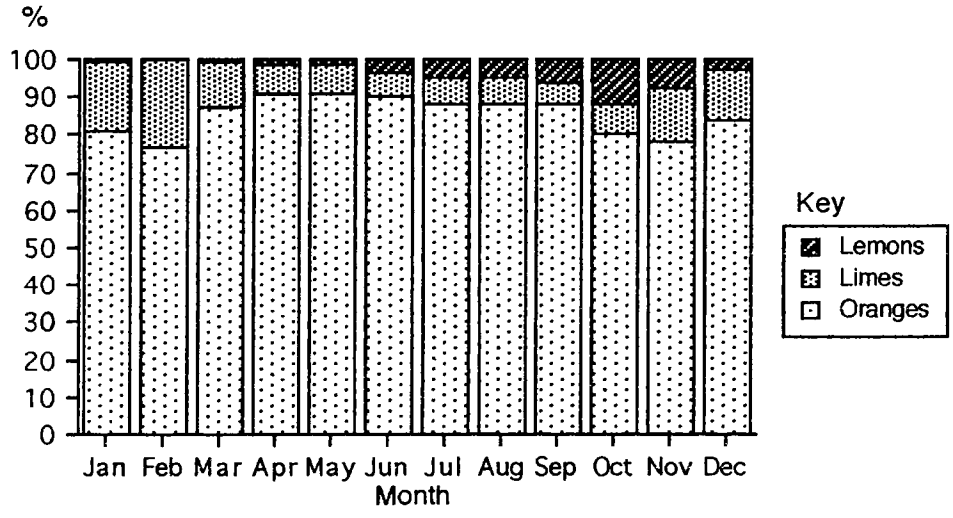
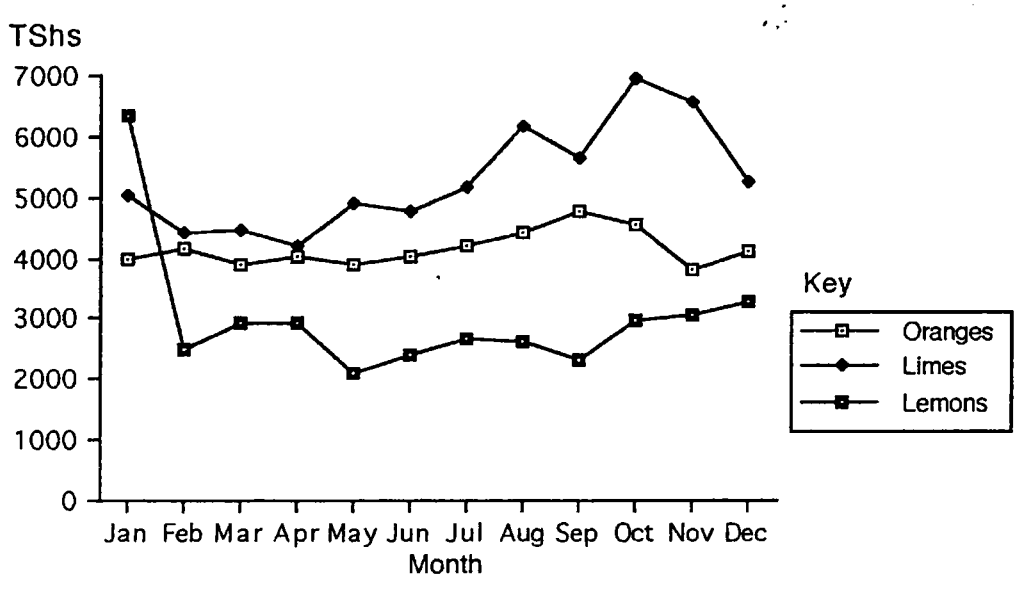


Figure 4.48, graphing the proportion of total citrus value delivered at Kariakoo, shows a clear domination by oranges, accounting for no less than 76 per cent, and as high as 90 per cent, throughout the year. The pattern of the proportion of the value citrus fruit deliveries accounted for by oranges declines initially from 80.7 per cent to 77.0 per cent in February, a decline of 37.4 per cent, from TShs 0.5 million to 0.3 million in February. The year begins with a slight increase in the proportion of citrus fruit value accounted for by limes and a concurrent decline in the proportion accounted for by oranges and lemons. Limes increase from 18.3 per cent to 22.7 per cent, while oranges decline from 80.7 per cent to 77.0 per cent and lemons from 1.0 per cent to 0.3 per cent, the lowest proportion Accounted for by this fruit. The decline in the proportion accounted for by oranges coincides with a decline of 37.4 per cent in the value from TShs 0.5 million to TShs 0.3 million. A concurrent decline in the value of limes of 18.0 per cent takes place, from TShs 116,804 (the highest recorded mean monthly value) to TShs 95,362 million. However, this is compensated for by the large decline in the value of deliveries of oranges. After this initial two months, the proportion of value accounted for by oranges increases to around 90 per cent. This proportion is maintained through to September, when the highest value of deliveries for oranges is recorded in both August and September at TShs 1.3 million, accounting for 87.7 per cent of the value of citrus fruit deliveries in each case. Lemons are at their lowest in terms of volume of delivery in the first three months of the year.

The later years of the time series see a decline in the delivery of lemons to the point that February records no deliveries of lemons in the last three years. In 1988, according to Kariakoo records the market went from February to August without receiving a single delivery of lemons.

Figure 4.49 Mean Monthly Citrus Fruit Price per Metric Tonne Delivered to Kariakoo Market (at 1981 values)



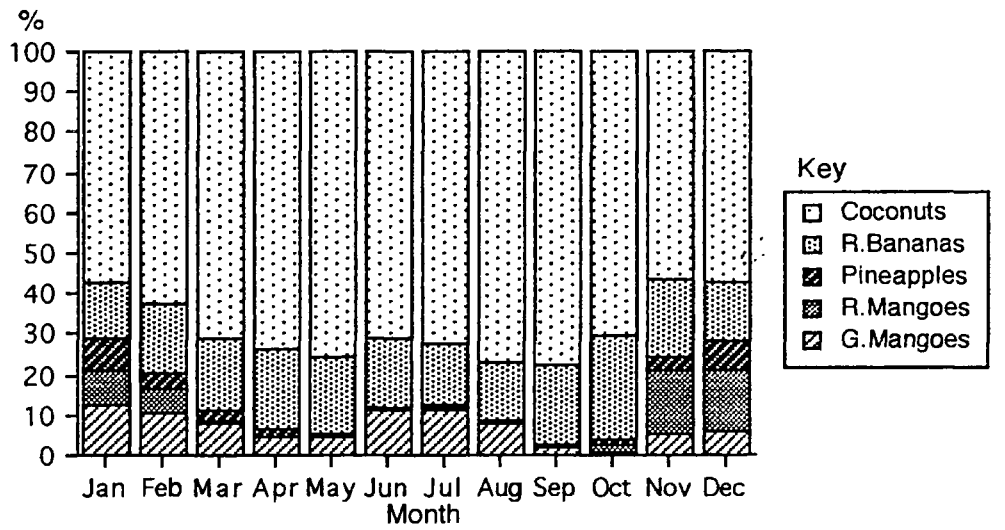
The proportion of the value of citrus fruit deliveries accounted for by limes ranges between 6 and 8 per cent from April through to October, but this is reflected in an increase in line with the increases in the value of orange deliveries, to the second highest value of deliveries in August at TShs 108,822. Lemons increase from February through to October when the highest mean monthly value of deliveries is recorded at TShs 110,446. This increase in volume and value of lime deliveries coincides with the sudden decline in the volume and value of deliveries of oranges, as the harvesting season in the main supply regions (Tanga and Morogoro) comes to an end in August. However, as discussed earlier, limes and lemons are consumed in a different way from oranges. The price of oranges does not increase, as much as might be expected, because of the complementary increases in the volume of deliveries of ripe mangoes, which are consumed in a similar way to oranges. When this is compared with the monthly volume variations, presented in Figure 4.17, the reason for the increase in price becomes apparent: September is the end of the main orange season and the volume of orange deliveries declines by 15.8 per cent in September and another 44.4 per cent in October. Hence, prices rise dramatically as demand outstrips supply. The subsequent fall in price in October is explained by the replacement of oranges as a refreshing 'snack' by the ripe mango, which begins its main season in October (see Figure 4.18). At the end of the dry season, the demand for a sweet juicy fruit is particularly great and this is partly met by ripe mangoes. These factors have the overall effect of keeping the orange price remarkably consistent, considering the wide variations in the volume of supply seen in Figure 4.17. This may suggest that other factors are also at work. If, as is suggested, the majority of the citrus fruits, particularly oranges, are by-passing

Kariakoo, then the factors influencing the price may be obscured by the fact that these data are far from a complete picture of the citrus fruit market in Dar es Salaam.

In summary, each of the citrus fruits examined in this survey have distinct harvesting seasons. In the case of oranges, this is between June and September; in the case of limes, this occurs initially in August, but more importantly from November to January; and in the case of lemons the peak value of deliveries occurs in September and October. As the higher value of deliveries occurs, so the price increases. This is apparent in each of the citrus fruits. Figure 4.49 demonstrates that the mean orange price maintains a relatively stable pattern throughout the year remaining between TShs 4,000 and TShs 4,786, which is recorded in September, as the mean volume declined from its highest at 369.7 metric tonnes in August to 311.1 metric tonnes in September. The price also declines in November to TShs 3,800, but this is likely to result from competition from ripe mangoes. September is the month when the highest mean monthly volume of ripe mango deliveries occurs, and this has a depressing effect on the price of the ripe mangoes and similar juicy, sweet fruit. As the ripe mango deliveries decline once more in December, the demand shifts back to oranges, thus both fruits' price increases in this month, which is also when the Christmas holiday occurs, with the effect of increasing demand. The hottest dry season reaches an end in February and this coincides with the decline in supply. The reduced demand for these fruit has the effect of depressing the price at the same time as the supply begins to decline.

The pattern of the value of fruit deliveries in the first few months of the year divides the five commodities into two groups. Coconuts and ripe bananas, which are far more consistent in their delivery through the year, increase in value. The values of green and ripe mangoes and pineapples, all of which have quite clearly defined main seasons, decline in the first four months, in the case of the mangoes, and the first eight months in the case of pineapples. Coconuts are clearly seen to account for the largest proportion of total fruit value, 68.6 per cent on average (Figure 4.50). Coconut deliveries in January amount to a mean monthly value of TShs 2.8 million, accounting for 57.4 per cent of fruit value. They increase to about TShs 3.0 million in March, April and May, the latter accounting for 75.8 per cent of fruit value. Ripe bananas account for an average of 17.7 per cent of the value of fruit deliveries and begin the year at TShs 655,737, accounting for 13.37 per cent of fruit value. The value of ripe banana deliveries increase consistently to TShs 781,545, accounting for 19.75 per cent of the fruit value by April. Green mangoes account for a mean proportion of 7.1 per cent of the fruit value and the first mean monthly value of delivery of the year is TShs 610,862 accounting for 12.5 per cent of fruit value, declining to TShs 177,696, accounting for 4.4 per cent of fruit value by May. A mean of TShs 425,483 worth of ripe mangoes are delivered in January, accounting for a mean of 2.6 per cent of fruit value compared with a mean proportion of 4.0 per cent of fruit value. This declines to TShs 1,274, accounting for 0.03 per cent by May. Pineapples account for a mean of 2.6 per cent of the fruit value, declining to TShs 35,735, accounting for 0.6 per cent of fruit value in August.

Figure 4.50 Percentage Profile of Mean Monthly Value of Fruit Deliveries

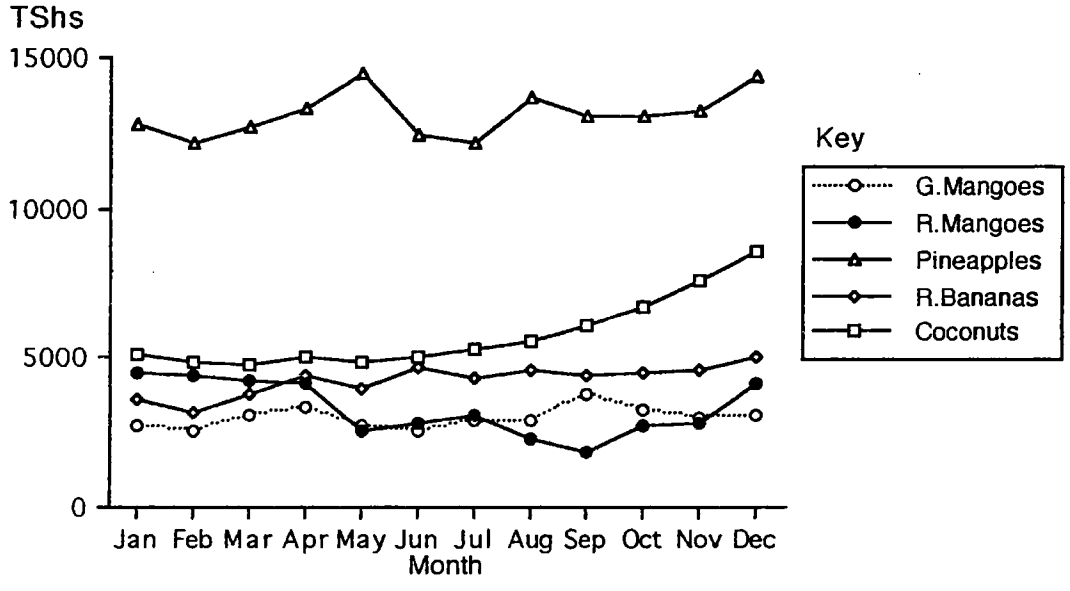


The dry season from May to September is when coconuts and ripe bananas account for the greatest proportion of overall fruit value. These two fruit alone account for a combined total of between 88 and 97 per cent of the overall value of fruit supplies in these five months. Roughly 10 per cent of the fruit supply is accounted for by a secondary wave of green mango deliveries of TShs 459,961 and TShs 616,029 in June and July. The mean value of delivery of coconuts and ripe bananas actually increases in the latter few months of the year. The mean value of ripe bananas increases from TShs 723,190 in August to TShs 1.1 million in October, accounting for 14.6 per cent and 25.5 per cent respectively, before declining to TShs 935,068, accounting for 14.5 per cent in December. The mean delivery value of coconuts from October declines initially from TShs 4.76 million to TShs 3.1 million, before increasing to TShs 3.7 million in December. In spite of these increases, the proportions of total fruit value they account for decline, because of the increase in importance of the other fruits. Ripe mangoes increase to TShs 861,076 in November and TShs 974,078 in December, accounting for 15.6 per cent and then 15.5 per cent of overall value respectively. Green mangoes increase to TShs 305,316 in November and TShs 397,080 in December, accounting for 5.5 and 6.2 per cent respectively. Pineapples increase to TShs 176,199 in November and TShs 461,530 in December, accounting for 3.2 and 7.2 per cent respectively. Only green mangoes out of these three fruits continue to increase in the value of their deliveries,reaching the higher value of TShs 610,862 in January, accounting for 12.5 per cent.

Mean monthly fruit prices are shown in Figure 4.51. Pineapples have the highest mean price per metric tonne, at TShs 13,111, but begin the year at TShs 12,766 per tonne, declining 4.5 per cent to TShs 12,191, before beginning a strong rise to its highest mean monthly price of the year at TShs 14,434 in May. The initial decline in price occurs in each of the other fruit commodities, a decline which ranges from 2.0 per cent in ripe mango price to 12.8 per cent in ripe bananas. The ripe mango decline continues through to May at the end of the main rainy season, when the price declines to TShs 2,555, when the supply is at its lowest. Deliveries of

the fruit at this time are infrequent, and in many years between 1981 and 1989 the months of April to October Kariakoo did not receive any delivery of ripe mangoes at all. Coconut prices begin with a decline in the first month of 5.4 per cent to TShs 4,859. During the next few months the mean monthly coconut price remains between TShs 4,800 and TShs 5,000, reaching TShs 5,045 in June. This consistency in price coincides with the value remaining within TShs 100,000 of TShs 3.0 million over the same months.

Figure 4.51 Mean Monthly Price per Metric Tonne of Fruit Delivered to Kariakoo Market (held constant at 1981 values)



Green mangoes at about TShs 3,004, have the lowest overall mean price per metric tonne for fruit. They begin the year at TShs 2,729 and after the small decline in February to TShs 2,597, increased by 18.7 and then 8.1 per cent to TShs 3,332 in April. This occurs as the supply of green mangoes declines at the end of the short intense dry season. Green mango prices decline in the months of May and June, as deliveries begin to increase once more for the secondary wave of deliveries, which peaks in July at 232.4 metric tonnes and TShs 616,029. The price falls from TShs 3,332 per metric tonne in April to TShs 2,763 in May and then TShs 2,583 in June, decreases of 17.1 per cent and 6.5 per cent respectively. As the secondary wave of green mango deliveries declines the price begins to increase once more to reach TShs 3,816 by September. The price of pineapples declines for the two months of June and July at the centre of the long dry season at just over TShs 12,000, increases in August to TShs 13,671, as the pineapple supply reaches its lowest in September. From May, when the coconut price is TShs 4,866, the coconut price increases consistently to the end of the year at TShs 8,550, an increase of 75.7 per cent over seven months. This increases at the same time as the decline in the mean volume of delivery of coconuts delivered to Kariakoo by 42.0 per cent from the highest delivery of coconuts in August at 887.9 metric tonnes to 514.3 metric tonnes.

The mean price of pineapples in September, October and November remains at just over TShs 13,000, and increases 8.7 per cent in December to TShs 14,347. This is the result of a combination of increased supply and increased demand as the second rainy season ends and the hottest dry season begins. The price of green mangoes declines once more in the latter few months of the year as the supply increases, with an increase of 5.6 per cent in December, as a result of the increased demand at this time. This coincides with an increase in the supply of green mangoes as the deliveries approach the highest mean monthly delivery which occurs in January. From August to December the price of ripe bananas does not vary more than 5.0 per cent except in December at around TShs 4,500, when the price increased, along with all the fruit crops, by 9.3 per cent to TShs 5,030as a result of the increased demand associated with this time of year.

If a comparison of the variations in price with the variations in volume of deliveries is made, a relationship emerges. Comparison of Figure 4.14 with Figure 4.44, shows that the months of February and June are the lowest in terms of overall tomato supply, but the highest in terms of price (all four tomato types record their highest mean monthly price per metric tonne between February and May). Tomatoes from Lushoto and Mbeya have a different pattern from the others: in the case of the other types, the price reaches a maximum in anticipation of the peak mean monthly delivery, the price 'curve' of the Lushoto and Mbeya tomatoes follows roughly the same shape as the delivery 'curve' (see Figures 4.12 and 4.44). The highest mean monthly delivery is in March, as is the highest mean monthly price. The lowest mean monthly price is in November in a trough which started in September. The lowest mean monthly delivery is in September.

A possible explanation for the unusual pattern followed by tomatoes from Lushoto/Mbeya is that some producers, mainly the more commercially-aware farmers, plant their tomatoes at a time of the year that will allow them to harvest during the lowest months of supply in Dar es Salaam. In spite of the fact that more chemical inputs are required to protect the plants through the less favourable rainy season of the year, this enables farmers to sell their produce at a premium price, when demand is high and they can therefore expect to increase their margin of return. This requires a greater amount of initial investment in the chemical inputs, and so is only an option to those farmers who can afford it or those who can arrange credit. For example, one farmer, who was interviewed followed this strategy in 1989 and reported selling 70 *matenga* (about 80 kilograms per *tenga*) at about TShs 10,000 per *tenga*. This comes to about TShs 125,000 per tonne, more than four times the highest monthly mean recorded by this sample survey. He was one of a small number to get to Dar es Salaam along roads that had been badly affected by particularly heavy rains, illustrating forcefully the importance of an effective transport network for an efficient food distribution system.

In the case of oranges, the sharp increase in price in September coincides with the beginning of the decline of the annual peak of orange deliveries and also with the beginning of the hottest

season of the year in Dar es Salaam. For limes, a sharp increase in price coincides with an increase in December of lime deliveries. This confirms the association of an increase in demand with an insufficient increase in supply in the period approaching the Christmas holiday.

The general trend for lemon prices is to increase during the course of the year, especially in December. This, however, is in contrast to the pattern of the mean volume of deliveries (Figure 4.17) which reaches a peak in September and begins to decline towards the end of the year. This may partly explain the increase in lime demand since these two fruits are used interchangeably for flavouring in cooking or as a garnish for salads.

This section has demonstrated seasonal monthly price variations, which may be explained in terms of monthly supply. In the case of some commodities, such as tomatoes, the overall supply is held relatively stable through the year, because of the different sources of supply complement each other. A second feature identified in this section is the large variations in price of highly seasonal commodities, such as the different tomato categories, oranges, peas and ripe mangoes. At the other extreme, the crops with more stable prices, such as pineapples, lemons, Irish potatoes and cabbage have more stable monthly prices. One exception to this general rule is the remarkable increase in the price of limes in December after a very stable mean monthly price throughout the rest of the year and relatively little change in supply in December. This highlights the need for an examination of factors external to the supply chain such as demand, disease and so on. In the case of limes this price increase can be explained by the dramatic increase in demand for limes as a garnish and for cooking at the Christmas festivities.

4.7 Kariakoo: Problems and the Future

This chapter has described the patterns of supply of fruit and vegetables to Kariakoo wholesale market through an analysis of price, volume and value recorded at the market. These patterns have been analysed in relation to the more qualitative data concerning conditions in the market and supply linkages. Various patterns of delivery have been described and a variety of explanations have been suggested. These explanations will be taken up in a later chapter in order to establish the various marketing linkages through which fruit and vegetables are distributed to Dar es Salaam. This chapter has demonstrated that Kariakoo is suffering from acute congestion. However, a closer examination is necessary to find solutions to the problems.

The evidence presented has demonstrated a rise in the volumes of vegetables such as onions, cabbage and Irish potatoes being delivered to Kariakoo. On the other hand, fruits such as oranges, green and ripe mangoes, lemons, pineapples, ripe bananas and coconuts are decreasing in importance, in terms of volume deliveries to the market. When presented alongside the increase in Dar es Salaam's population, this evidence points to a gradual process

of specialisation at Kariakoo. This is not the result of deliberate KMC policy, but the result of a combination of 'demand-led' and 'supply-led' movement of fruit marketing to alternative markets around the city. This, in turn, is a response to the increasing liberalisation of the Tanzanian economy since the mid-1980s, reflecting the changing political economy of the country.

This process has favoured retail markets which are more accessible to transporters arriving in the city, who do not wish to become involved in the traffic congestion often experienced in the Kariakoo area. Examples of this trend include the delivery of oranges from the south of Tanzania to Tandika market located near the main road from the south of the country; the supply of oranges from the north of Tanzania to Tandale market on the main road from the north; and at Buguruni on the Port Access Road, which leads from the main road from the north towards the port. This is also demonstrated by the availability of tomatoes from areas along the road to Bagamoyo at Mwenge market on Bagamoyo Road itself. This aspect of the role of the various urban retail markets in receiving fruit and vegetable deliveries direct from the areas of production, will be returned to in more detail in a later chapter.

A report commissioned by KMC, and produced by the Ministry of Agriculture's Marketing Development Bureau, found three main shortcomings of the Kariakoo wholesale market. The market area was considered to be too small for the volume of trade and no space was available for expansion. Consequently, there is not enough handling space and high stacking of produce using unsuitable containers is necessary. Secondly, handling conditions are difficult due to the unsuitable and inflexible layout of the market area - including insufficient access from the outside. Finally, the ventilation is considered insufficient, which results in stagnating humid air and high temperatures. This accelerates the decomposition of highly perishable produce (Marketing Development Bureau, 1985).

When produce is stacked too high it will increase the likelihood of damage. The inflexibility of the layout of the trading floor results in no possibility of expansion, and moving produce into, around and out of the trading area becomes difficult. The lack of space and congestion is clearly shown when at various times the discarded packing and spoiled produce begins to form a carpet of debris along the access ways between the traders' areas. These deposits often become concentrated, impeding porters, traders, buyers and KMC staff, as they go about their work.

The increasing population of Dar es Salaam will result in a continued increase in the demand for fruit and vegetables. The constant high level of approximately 70,000 metric tonnes of volume being handled annually by Kariakoo since 1983, suggests that Kariakoo can expand its handling capacity no further. The increased demand, therefore, over the last seven or eight years has been progressively absorbed by the alternative, 'informal' wholesaling sector. The continued increase in the handling of the fruit and vegetables entering Dar es Salaam, gives increased credibility and importance to the role of this informal sector. This transfer will involve a change in

buying patterns, as the buyers begin to seek out alternative sources of fruit and vegetables, that will not be easy to reverse. The open air, flexible, non-commision-levying, 'informal' wholesale markets will begin to seem more attractive to both buyers and suppliers.

Many 'farmers' still prefer Kariakoo, because of its large and ready market, its good loading and unloading facilities, its central location and its large number of buyers who ensure that produce turns over rapidly. However, the dis-benefits of over-crowding, warm humid conditions and the commission levy may have begun to repel Kariakoo's buyers and sellers. In a review of fruit and vegetable marketing in the developing world, Abbott gives Kariakoo's three main problems as :-

- Throughput is far in excess of the 26,000 tonnes per year for which the market was intended; by 1978 it was already 63,000 tonnes.
- High temperatures, humidity and poor ventilation accelerated spoilage and make working difficult.
- Produce has to be carried through congested sales areas, out again over the same route up a steep ramp 4-5m to street level loading bays; this is done by porter.

(Abbott 1986, p.201-202)

The MDB report came to three basic conclusions. Firstly, the wholesale market should be relocated outside the city on a main access road, such as the Nelson Mandela Road. Secondly, the commission charged on produce is too high and administratively costly. Finally, in the future more attention should be given to layout and design, including the possibility of future expansion (MDB, 1985). These three conclusions appear to have been pre-empted by the spontaneous response of the informal sector. Firstly, fruit which is less expensive in terms of price-to-weight ratios and which must be sold and distributed rapidly, because of their high perishability, have tended to be delivered at more peripherally located retail markets. Secondly, one of the advantages for the traders of this produce avoiding Kariakoo is that the full KMC commission is not charged. Finally, the retail markets are all located on flat land and have spontaneously expanded to cope with their increased trade. In the case of Mwenge, Buguruni, Ubungo and Kinondoni, there is space still available for limited further expansion.

When KMC commissioned this report it had already obtained a plot of land at the side of the Port Access Road (recently renamed Nelson Mandela Avenue), a dual carriageway which acts as a partial ring road for Dar es Salaam. However, according to MDB calculations, this site is too small to absorb the projected volumes of trade. The MDB estimate that the demand in Dar es Salaam for fruit and vegetables will increase to a total of 505,600 metric tonnes in the year 2000, from their estimate of total demand in the city in 1985 of 225,600 metric tonnes (see Table 4.6) According to this estimate, if Kariakoo, or a replacement wholesale market continues to deal with deliveries to the city at the same proportion as Kariakoo (roughly 50 per cent), Kariakoo, or the replacement will have to be able to handle a throughput of over 250,000 metric tonnes. This

estimate does not include the beans, starches (such as cooking bananas, a large proportion of which enter the city's market throught Kariakoo) and fish, which the market currently also deals with. Based on the 1985 figures, there is currently 2,400 square metres of open trading area in Kariakoo wholesale market. This was originally designed for the trading of 35,000 metric tonnes.

If we assume that the MDB estimates are correct and that the replacement market is intended to deal with even half of the estimated fruit and vegetable wholesale market in the year 2000, as estimated above, this suggests that 17,000 square metres of trading space are required for fruit and vegetables alone. The MDB estimate that an average of 79 lorries and 30 pick-ups deliver produce to the market every day. They estimate that the number of collecting vehicles averages 370 per day. An increase in volume of the level suggested is likely to result in a tripling of this volume of traffic. In order to manage such a volume an enormous amount of space is required not only for the trading and storing of produce, but also to manage the traffic outside the market. It is clear, therefore that the current site owned by the Kariakoo Market Corporation of 13,000 square metres is inadequate for the purpose (Kariakoo Market Corporation, 1986).

Table 4.6 Marketing Development Bureau Estimates of the Fruit Vegetable, Starches and Nut Demand in Dar es Salaam

Commodity	1985	1990	2000
Fruit	50,400	78,500	159,800
Vegetables	95,800	157,100	345,800
Starches and Nuts	327,500	494,400	997,400

Source: Marketing Development Bureau, 1986.

As a result of the research carried out for this study the following additional points are appropriate. Kariakoo wholesale market must now consider itself to be operating in competition with alternative retail markets for both suppliers and buyers. As such, Kariakoo has a number of advantages over its competitors, such as the 'good will' of regular traders, which has been built up over a considerable period of time. It has a central location, it has an organised structure of porters and auctioneers - although this has apparently become obsolete - it has loading bays and it has the protection of the building from adverse weather and theft when the market is closed for business. This study will demonstrate in later chapters that the supply chains currently built up are based on the contacts and knowledge of those involved in the buying and selling and not just in the physical roads buildings and vehicles. A complete shift in location of Dar es Salaam fruit and vegetable wholesaling would result in immense disruption of the food distribution chains. Finally, any future planning must take into account the periodic fluctuations in daily, monthly and annual supply, as they have been described in this chapter and the reasons behind them, such as climate, the growing season, consumer demand, seed and input availability and transport problems. Any solution suggested for the problems of congestion should be able to adapt to absorb any mean increases in the trade, but also the maxima of supply and demand.

A more pragmatic approach to the problems of Kariakoo in the light of this research may be the partial relocation of the wholesaling market to a peripheral location, such as that which currently exists on the Port Access Road. Such a wholesale market could target itself for the commodities which Kariakoo has been losing to informal wholesalers at the retail markets and which would benefit from a more peripheral wholesaling location. Clearly, more detailed examination of this suggestion would have to be carried out, but the evidence presented in this and later chapters will bear out the hypothesis that, if the current plan were to go ahead, significant disruption to the food distribution chains would occur.

Chapter Five

Dar es Salaam Retail Markets

5.1 The Survey Approach

This chapter examines the role of the retail markets of Dar es Salaam in the supply of fruit and vegetables to the city. This will be achieved by using a questionnaire survey of a sample of 153 market traders in six of the city's main retail markets, by examination of secondary data, and from in-depth interviews carried out with market officials and observations recorded by the author. Map 3.1 shows the location of the six markets surveyed. The rationale of the selection of the six markets and a description of each appears in an earlier chapter.

Table 5.1 Market Survey Responses.

Market	Responses	Day	Total No. of traders
Mwenge	25	Wed (7/9/89)	75
Ubungo	25	Thurs (8/9/89)	120
Tandale	24	Fri (9/9/89)	[100 wholesalers]
Ilala	25	Sun (11/9/89)	[120]
Tandika	24	Mon (12/9/89)	485
Kinondoni	30	Sat/Mon (10 & 26/9/89)	[60]
6 markets	153	6 Days	[475]

Source: Author's Survey
[Values given in square brackets are estimates]

As can be seen from Table 5.1, the survey of Kinondoni market was carried out over two days and yielded 30 respondents. The reason for this was that difficulties were experienced in attempting to carry out the survey in the absence of the market secretary. After some reluctance among the traders to co-operate, it was decided to abandon the survey and return to carry it out two weeks later, when the secretary was available. The second occasion was more successful as the traders were far more co-operative with the market secretary present.

A copy of the questionnaire form is presented in Appendix 3.3. The form has eight questions and was designed with the intention of obtaining the co-operation of the market traders with the minimum of interference in their marketing activities. The response rate was very good, with few traders refusing to respond where the market secretary was available to give help. Each interview took about five minutes and, in most cases, the trader was able to continue selling, while answering the questions put to him or her. The questionnaire asks basic questions about the gender, length of time in business, and type and source of produce that the traders sell. More specific data on the traders' sources of produce, the method of transportation to the market and the people to whom they sell their produce are then solicited. The focus for the

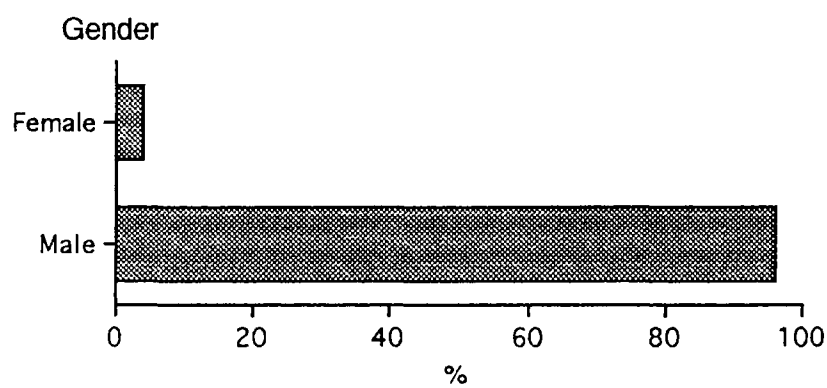
survey is the role of traders, who operate in the retail markets, in the distribution linkages for the city as a whole.

The choice of markets is detailed in an earlier chapter, but it should be noted that the markets, on which this survey is concentrated, are among the biggest in Dar es Salaam. For the purposes of his fieldwork, Sporrek (1985), defined a market as a grouping of five or more stalls. For the purposes of food retailing these 'markets' are important to the Dar es Salaam population. This questionnaire survey, however, investigated the role of traders in the city's wholesale supply of fruit and vegetables, who operated outside Kariakoo. Interviews of Marketing Development Bureau and Kariakoo Market officials, carried out before the questionnaire survey took place, indicated that this mainly takes place in the city's retail markets on an informal basis. There were reports, however, of wholesaling of quantities of food from lorries at pre-arranged meeting places on the outskirts of the city or simply at the side of the road. The questionnaire survey has focused on the more informal trading and has provided information about both informal wholesaling and the ways in which retailers obtain their produce in the main retail markets of the city.

5.2 Survey Results

Figure 5.1 shows a clear bias towards male traders, with 96 per cent of the respondents being males, and only 4 per cent female respondents. This reflects the strong influence of Muslim culture in the city, which discourages women being involved in commercial activities. When this information is examined more closely, it becomes clear that the small number of women responding to the questionnaire are only involved in selling direct to consumers and not to other traders. In addition, the markets where women were interviewed were Mwenge and Ilala, markets which have a limited amount of wholesaling activities. None of the female respondents had been in business for longer than 3 years and they were operating in markets in the more peripheral residential areas of the city.

Figure 5.1 Gender of the Traders Interviewed in The Retailing Survey



This evidence bears out the information received from discussions with a number of Dar es Salaam residents, as well as the interviews with market secretaries, that women are generally not involved in urban marketing of fruit and vegetables in Tanzania. This is very different to West Africa, for example, where, in some cases, women have control of the fruit and vegetable markets (Hodder, 1967; Lawson, 1971; Abbott 1986). In Dar es Salaam women are to be found selling bread, some handicrafts, such as basketware and cloths, and cooked foods such as boiled rice and *ugali* (maize-meal).

An additional factor may be that the assistant interviewing the traders was male, hence introducing an element of interview bias, either on the part of the interviewer, or on the part of women who may have been reluctant to answer such a questionnaire. The author did observe women selling in several of the other markets, but only in small numbers and often not selling fruit or vegetables, but fish or basketware. It may be, therefore, that women are under-represented in this survey. However, because of the complex sociological and cultural issues involved, a more comprehensive approach is required to investigate in great detail the role of women in Dar es Salaam's urban markets than is possible here.

Figure 5.2 The Number of Years Traders Have Been in Business

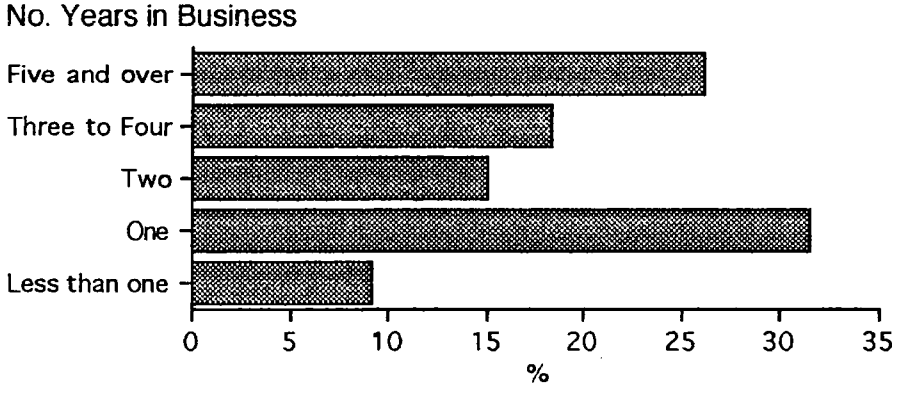


Figure 5.2 shows that over 40 per cent of the traders interviewed had been in business for less than two years, and 69 per cent of the traders responding said they had been in business for three years or less. As the number of years increases, the data become increasingly unreliable, because, in common with Sporrek's survey (1985), traders appeared to find greater difficulty in remembering the precise number of years they had been in business. This can also be seen by the clustering of traders at around the five and ten year levels as they have rounded off the number of years, in an effort to remember.

Table 5.2 Number of Years Retailers Had Been in Business (Sporrek's 1976 Survey)

Length of Time	Percent
Less than One Year	16
One to Three Years	25
Three to Five Years	17
Five to Ten Years	25
Over Ten Years	17

Source: Sporrek 1985

The modal length of time for being in business in a retail market is one year, with 31.4 per cent of respondents giving this reply. This suggests a relatively high turnover of traders, with only 1 in 5 surviving longer than five years. This may indicate the unstable nature of business in the fruit and vegetable trade in Dar es Salaam in the mid 1980s, resulting from the more general stagnant condition of the Tanzanian economy, as discussed earlier. The liberalisation of trading regulations did not begin to have an obvious impact on the economy until at least two years after the Economic Recovery Programme was adopted in 1986. Even at the time of the survey it was not clear that all the effects had influenced the economy.

A comparison between the results of Sporrek's survey of retail traders, presented in Table 5.2 and those of this study, presented in Figure 5.2, suggest some differences. Firstly, the data are not totally compatible. However, if the first two groups for each survey are combined, this shows that 41 per cent of the Sporrek survey had entered the retail market less than three years before the question was asked in 1976. In the case of the author's survey 41.6 per cent had entered the fruit and vegetable market less than three years before the question was asked in 1989. This would suggest a remarkable consistency and rule out any suggestion that the high turnover of traders has changed since 1976. However, Sporrek's survey took in a large number of street-side sellers, many of whom would require very little capital; indeed, he reports that 9 per cent of his sample were children. One would expect this cohort to represent a large proportion of the recently established traders, as there is indeed a high turnover of this group. On the other hand, the present survey carried out by the author is of market licensed traders. This group requires a greater degree of capital to invest in the trading licence, pay for stall rental and so on, as well as to purchase the greater quantities of food likely to be sold from this location. The latter group would be expected to have been established for a longer period of time, and to be relatively more stable in their trading activities than the peripatetic and street-side traders likely to have participated in Sporrek's study. This does suggest, therefore, that there has been a period of change in the fruit and vegetable market with a cohort of recently established market retailers.

A second factor may have contributed to the high proportion of traders in business for a relatively short period of time. Trading of fruit and vegetables has been in the hands of the private sector since Independence, and the state has only played a regulatory role; in the case

of Dar es Salaam the rule has been that all fruit and vegetables entering the city must pass through Kariakoo. In 1986 the National Milling Corporation's monopoly on trading of staple foods was removed, allowing private traders to begin trading. Mindful of the speed with which the private sector has taken up this opportunity, there is the question as to where the capital to absorb this level of commercial expansion has come from. It would appear that informal trading of staples was already at an advanced stage by the time the market was liberalised and that this simply served to legitimise an already important informal trade. However, the Marketing Development Bureau estimated that as early as 1988, open market channels accounted for 65 per cent of maize and 94 per cent of rice trading (Marketing Development Bureau 1987), and the National Milling Corporation had more or less limited its operations to the management of the Strategic Grain Reserve, the importing of food and the distribution of food aid, suggesting that the private market in staples has expanded very rapidly in recent years. One explanation may be that the already successful fruit and vegetable traders moved into the staple markets. This in turn released opportunities for new traders to emerge in the fruit and vegetable markets in the last five years. This explanation is strengthened by the results of a survey of Manzese staple food traders carried out by Gordon (1988), which revealed that the ethnic profile of these traders was dominated by the Waluguru, accounting for 33 per cent of the total, the remainder made up of thirteen different groups. Gordon explains this dominance as being due to the fact that the Waluguru have historically been a strong ethnic group in the trade of fruit and vegetables from Morogoro to Dar es Salaam. The years of controlled markets have meant that fruit and vegetable traders have a comparative advantage in their experience of the long haul food trade and in trading skills, experience and established networks of business contacts.

Table 5.3 Cross Tabulation of the Number of Years the Traders Have Been in Business by the Type of Customers To Whom They are Selling

Count *Expected Value*	Other Customers	Consumers	Row Total
Up to One Year	10 *17.8*	51 *43.2*	61 40.4%
Two Years	3 *6.7*	20 *16.3*	23 15.2%
Three to Four Years	9 *8.1*	19 *19.9*	28 18.5%
More Than Five Years	22 *11.3*	17 *27.7*	39 25.8%
Column Percent	44 29.1%	107 70.9%	151 100.0%

Chi-Square	21.85
Degrees of Freedom	3
Significance	0.0001

As the length of time a trader is in business increases, so the greater is the likelihood of the traders selling to other traders, rather than to consumers. Table 5.3 shows that over half of the traders with five or years experience are selling to other traders, whereas, of those with one

year or less, only 16 per cent are involved in this wholesale trade. The reason for this may be that some of the traders who have been able to diversify into wholesale trading activities have been able to survive longer, since they have not had to rely solely on their retailing to survive. Alternatively, traders who have been in business longer are likely to have had more opportunities for diversifying their activities. Table 5.3 also has a highly significant chi-squared value, which confirms the significance of the relationship between the length of time in business and the main customer to whom a trader is likely to sell.

Table 5.4 Cross-Tabulation of The Market Location by the Number of Years the Traders Have Been in Business

Count *Expected Value*	Up to One Year	Two to Four Years	More Than Five Years	Row Total
Mwenge	6 *10.1*	8 *8.4*	11 *6.5*	25 16.3%
Ubungo	21 *10.1*	4 *8.4*	0 *6.5*	25 15.7%
Tandale	4 *9.7*	6 *8.0*	14 *6.3*	24 15.7%
Ilala	5 *10.1*	12 *8.4*	8 *6.5*	25 16.3%
Tandika	10 *9.7*	7 *8.0*	7 *6.3*	24 15.7%
Kinondoni	16 *12.2*	14 *10.0*	0 *7.8*	30 19.6%
Column Percent	62 40.5%	51 33.3%	39 26.1%	153 100.0%

Chi-Square	53.91
Degrees of Freedom	10
Significance	0.0000

Table 5.4 shows Kinondoni and Ubungo markets to be dominated by relatively recently established traders, with no-one in Ubungo having been in business for more than three years and only four having been in business for longer. Of the entire sample, only 12 respondents (7.8 per cent) have been in business for more than ten years, half of whom are trading in Tandale market: 58.3 per cent of Tandale traders have been in business for more than 5 years, accounting for a very large proportion of more experienced traders in comparison with other markets. These traders have been able to survive the worst period of Tanzania's economic stagnation. This suggests that they are more resilient traders, who have had the skills and perhaps capital to allow them to survive in business in the face of more erratic variations, such as adverse annual climatic variations or the impact of a series of currency devaluations, as discussed earlier. Tandale has no traders in the group with 2 years experience, and in fact the overall proportion in the 2 years and 3 to 4 years groups are low. This also suggests that these markets experienced decline 3 or 4 years before the survey, when either no new traders began business or those that did, did not survive. This coincides with the economic low-point in the performance of the Tanzanian economy. Ubungo, Kinondoni and, to some extent, Tandika have all demonstrated a skewed distribution towards the lower number of years of experience. This suggests an increase in the amount of business activity in these markets within the last few

years, particularly in the case of traders in Ubungo, where no traders had been in business for more than 2 years. This may be in response to increased business confidence generally in Tanzania since 'liberalisation'.

Table 5.5 cross-tabulates the data from the length of time in business with the traders' sources of produce. A chi square test indicates that there is not a statistical relationship between the variables, but there are a number of points worth noting. The traders with more experience gave a wider range of sources with 47 per cent using sources other than Kariakoo as their main source of produce. This contrasts with less experienced traders, where 95 per cent of traders with less than 1 year's experience have concentrated their sources in Dar es Salaam, with 62 per cent obtaining their produce from Kariakoo.

Table 5.5 Cross-Tabulation of the Number of Years the Respondents Have Been in Business and their Origin of Fruit and Vegetables

Count *Expected Value*	Kariakoo	Dar es Salaam (other than Kariakoo)	Other & Outside Dar es Salaam	Row Total
Up to One Year	38 *38.9*	20 *17.6*	3 *4.4*	61 40.1%
Two Years	18 *14.7*	5 *6.6*	0 *1.7*	23 15.1%
Three to Four Years	20 *17.9*	7 *8.1*	1 *2.0*	28 18.4%
More Than Five Years	21 *25.5*	12 *11.6*	5 *1.6*	40 26.3%
Column Percent	97 63.8%	44 28.9%	11 7.2	152 100.0%

Chi-Square	11.81
Degrees of Freedom	6
Significance	0.08

A greater proportion of those traders, who have been in business for more than 5 years, give lorries as the method of transport by which their produce arrives at the market (Table 5.6). Although the distribution of the frequencies make a chi square test of relationship inconlusive, this cross-tabulation suggests a greater degree of purchasing from lorries among those traders who have been in business for over five years. A total of five traders, accounting for 10 per cent of traders with up to one year's experience and 4 per cent of all respondents, obtain their produce from lorry deliveries. In contrast, there is only one trader from the two middle year groups, who obtains produce from lorry deliveries. The reason for this is likely to lie in the fact that a large amount of capital is required to hire a lorry. At the time of the survey, the hire of a 10-tonne lorry to carry commodities to Dar es Salaam cost TShs 75,000, while the cost of hiring a 7-tonne truck from Mgeta in the Uluguru Mountains, near Morogoro, to Dar es Salaam was between TShs 40,000 and 45 ,000. Traders who have only been in business for a short time are less likely to have either obtained sufficient capital to pay for the hire in advance, or to have the business contacts to obtain a hired lorry on credit until the produce is sold.

This shows that the more experienced traders are more likely to be involved directly in wholesaling activities. They meet and purchase produce which arrives by lorry from distant supply areas and then sell it to traders either in their market or elsewhere, such as smaller markets or stalls nearby, and in some cases in other retail markets. These purchasers obtain the produce they will sell for the day and transport it in a hired pick-up back to the market. There are two main strategies for obtaining transport for produce. If the trader has sufficient capital (s)he can purchase enough goods to fill a hired pick-up and sell his or her surplus to colleagues on return to the market. Alternatively, a group of traders may collectively hire a pick-up and split their expenses.

Table 5.6 Cross-Tabulation of the Number of Years the Respondents Have Been in Business and the Method of Transportation

Count *Expected Value*	Lorry	Pick-up	Other	Row Total
Up to One Year	5 *6.1*	40 *39.3*	6 *5.7*	51 40.5%
Two Years	0 *2.6*	20 *16.9*	2 *2.4*	22 17.5%
Three to Four Years	1 *3.0*	22 *19.3*	2 *2.8*	25 19.8%
More Than Five Years	9 *3.3*	15 *21.6*	4 *3.1*	28 22.2%
Column Percent	15 11.9	97 77.0	14 11.1	126 100.0%

In an attempt to assess the relative importance of different comodities, traders were asked to list those they sold in order of importance. Table 5.7 combines the various priorities assigned to the fruit and vegetable commodities by the traders, in terms of the importance to their business. In terms of the number of traders involved, oranges are the most important crop, with 29 per cent of respondents selling them. This is followed by tomatoes, accounting for 25 per cent, onions (25 per cent) bananas (both cooking and sweet, 24 per cent) and Irish potatoes (16 per cent). The importance of oranges in the retail market is rather different to their importance in the Kariakoo wholesale market. In terms of volume, oranges account for only 2 per cent of Kariakoo's annual volume of deliveries in 1987. In terms of number of traders selling these crops, the survey shows that 29 per cent of traders surveyed sell oranges and only 16 per cent sell Irish potatoes (which are relatively more important at Kariakoo than oranges). This suggests that a very large proportion of the orange supply is by-passing Kariakoo and going straight to the city's retail markets. Bananas, tomatoes and onions follow in importance, and indeed are among the most important crops at Kariakoo, although not in the same order of priority.

These differences may reflect the retailing structure of individual commodities, rather than their relative importance in terms of volume. For example, Irish potatoes are the most important Kariakoo vegetable, but here, in terms of percentage of traders selling, bananas, tomatoes and onions come ahead of them. This may simply be because Irish potatoes are sold by a smaller number of traders, who specialise in that commodity, rather than the fact that Irish potatoes are less significant outside Kariakoo.

Table 5.7 Commodities Sold by the Respondents Grouped and in Order of Importance

Commodity	1	2	3	4	5	Total	Weighted Score	% of Sample
Vegetables								
Onions	10	15	11	-	2	38	145	25
I. Potatoes	13	5	4	2	-	24	101	16
Mchiha	14	4	2	-	-	20	92	13
Cabbage	7	10	1	3	1	22	85	14
Peas	6	8	5	-	2	20	79	14
Beans	6	6	1	4	2	19	67	12
Sweet Pepper	5	3	1	3	1	13	47	8
Garlic	-	2	3	-	1	6	17	4
Pigeon Peas	1	-	-	2	-	3	9	2
Carrots	-	-	3	-	-	3	9	2
Sweet Potatoes	-	2	-	-	-	2	8	2
Cucumber	1	-	-	-	-	1	4	> 1
Aubergines	-	-	-	-	1	1	1	> 1
Fruit								
Bananas	27	7	-	-	2	36	165	24
Mangoes	4	3	1	3	-	11	41	7
Pineapples	-	4	5	1	-	10	33	7
Paw Paw	2	2	2	-	-	6	24	4
Coconuts	2	-	1	-	-	3	13	2
Bread Fruit	-	-	-	-	1	1	1	
Citrus								
Oranges	34	7	2	2	-	45	208	29
Tangerines	3	8	4	-	-	15	59	10
Lemons	1	2	3	1	-	7	24	5
Limes	-	1	1	2	-	4	11	3
Tomatoes								
Tomatoes	16	7	8	7	1	39	147	25
Bitter Tomatoes	2	1	-	-	-	3	14	2

Source: Author's Survey

Figure 5.3 shows that 72 per cent of the respondents report that they sell fruit and vegetables only. The reasons for this are not immediately clear, but will emerge as this result is compared with other variables. A chi-square test of the number of years in business against whether or not the trader only sells fruit and vegetables failed to find a significant difference, indicating that the number of years in business is not an important factor in the decision to specialise in fruit and vegetables only (Table 5.7).

Figure 5.3 The Level of Specialism Among Fruit and Vegetable Traders

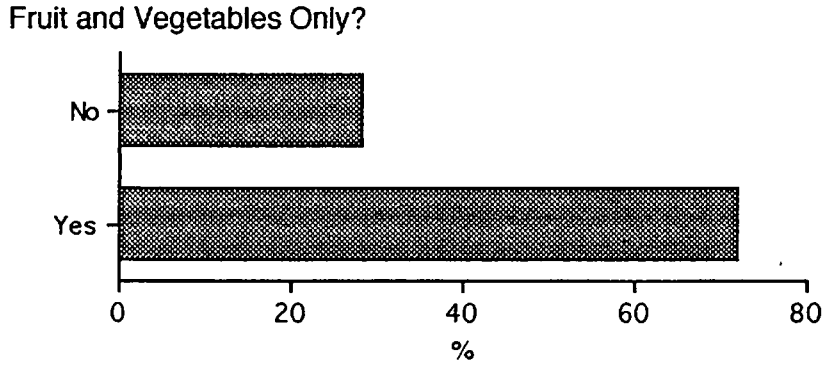


Figure 5.4 Dar es Salaam Traders' Main Customers

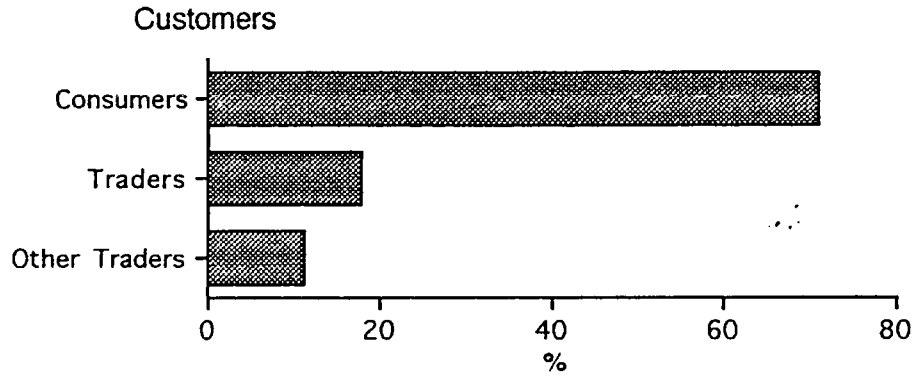


Figure 5.4 sets out the responses of traders in terms of their main customers. This question =separates the traders in the retail markets, whose predominant activity is wholesale trading (29.1 per cent), and those whose dominant activity is retailing (70.9 per cent). The wholesalers are also separated into two groups, those who sell mainly to traders in their own markets (17.9 per cent), and those who sell to traders from other markets (11.3 per cent). Interviews with market traders and officials suggest that a number of these market traders buy a large volume of produce at a wholesale market, which they transport back to their retail market. This they sell to their colleagues in the market, as part of their normal trading activities, and the rest they retail themselves. These traders do not fall clearly into either of the two categories given in the questionnaire. They sell a greater volume of produce to other traders than they retail to consumers, but, they may actually spend more time retailing. The response they gave to the questionnaire depended on their interpretation.

The predominant proportion of traders in the markets surveyed are mainly involved in retailing. Interpretation of this, however should bear two considerations in mind. Firstly, trader-trader transactions will inevitably involve greater volumes of produce at the wholesale levels than at the retail level. At the urban stages of the distribution chain the produce is continually unbulked, as it is sold from transporter to wholesaler to sub-wholesaler to retailer to consumer. It is, therefore, reasonable to assume that, although roughly 30 per cent of the traders are involved in the selling of produce to other traders, a greater proportion of produce volume is sold between the traders at this level. Secondly, it is worth noting that 23 per cent of respondents identified two main customers, indicating that a significant proportion of the sample take opportunities to sell to different customers. The majority of these respondents' (57 per cent) secondary customers were traders from outside their market. Interviews and observations suggest that these customers are *duka* owners or small street-side sellers, who operate from stalls or selling areas near to the market.

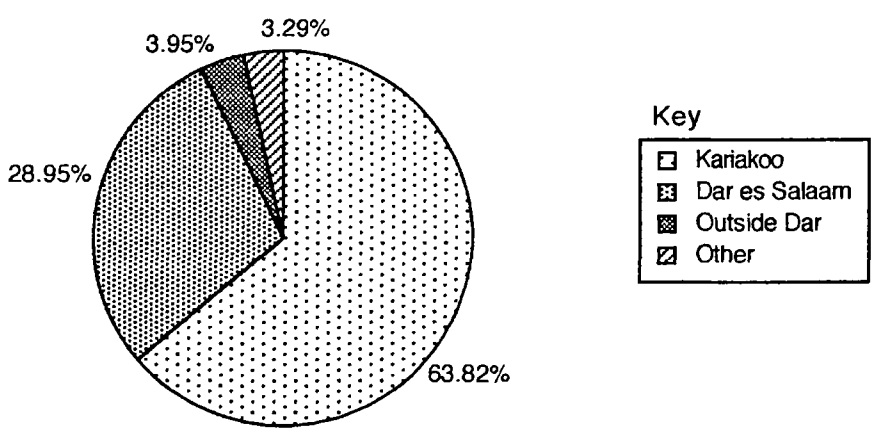
Table 5.8 Analysis of Variance of The Number of Years Traders Have Been in Business Broken down by the Type of Customer to Whom they Sell

Category	Sum	Mean	Standard Deviation	Sum of Squares	Cases
Consumers	279	6.34	6.32	1715.89	44
Other Traders	293	2.74	3.52	1314.67	107
Within Groups Total	293	3.79	4.51	3030.56	151

Source	*Sum of Square*	*D.F.*	*Mean Square*	*F-Ratio*	*Significance*
Between Groups	404.66	1	404.66	19.90	0.0000
Within Groups	3030.56	149	20.34		

Table 5.8 shows that the mean number of years traders who sell direct to consumers, have been in business is 2.7, whilst the mean number of years traders who sell to other traders have been in business is 6.3. This produces an F-ratio of 19.9, which is significant at the p=0.0001 level, demonstrating a statistically significant difference between the number of years in business by wholesale and retail traders. This reinforces the suggestion that retail trading is less stable than wholesale trading, but it may also be explained by the fact that the traders, who have survived the longest, have diversified into other activities in order to survive. By getting involved in buying and selling with traders, as well as consumers, a trader can increase his margins and his turnover. This provides greater opportunities for gain and thus also reduces the trader's risk.

Figure 5.5 Sources of Fruit and Vegetable Produce Reported by Retail Traders



The respondents were asked to give the main source for their produce. Figure 5.5 shows that the largest proportion, 63.8 per cent, of the respondents gave Kariakoo as their main source for fruit and vegetable produce. In view of the fact that it is technically illegal for traders to buy their produce from anywhere other than Kariakoo, it can be expected that a proportion of respondents would give Kariakoo in reply to this question, if they are at all wary of the motives of the interviewer. This suggests that in reality this proportion could be revised downwards,

although it is difficult to say by how much. In spite of this, 36.2 per cent still give sources other than Kariakoo, which is a large response considering the legal monopoly held by Kariakoo. However, it should be noted that interviews with some market officials indicate that traders 'shop around', and that this proportion is by no means static. For example, a trader taking the bus to Kariakoo wholesale market may visit Tandale market to compare the prices and also the quality of the produce (s)he is seeking. This evidence reinforces the argument that Kariakoo is competing with the other markets in its wholesale trading of fruit and vegetables.

Table 5.9 shows that the number of years in business traders buying from Kariakoo have, is roughly the same as those for the traders who purchase from elsewhere in Dar es Salaam, namely 3.4 and 3.8 respectively. In the case of those using 'other' sources, such as informal peri-urban production, the mean number of years in business is 2.2 years, although the number of cases here is only 5. Finally, of those obtaining their produce from outside Dar es Salaam, there are only 6 cases, but the mean number of years in business is 10.8. This further reinforces the notion that the wholesale traders in the urban retailing markets in Dar es Salaam tend to have a far greater business experience. The analysis of variance produced an F-ratio of 4.98, which is significant at the p>=0.005 level, demonstrating a significant statistical relationship between the number of years in business and the source of supply of produce.

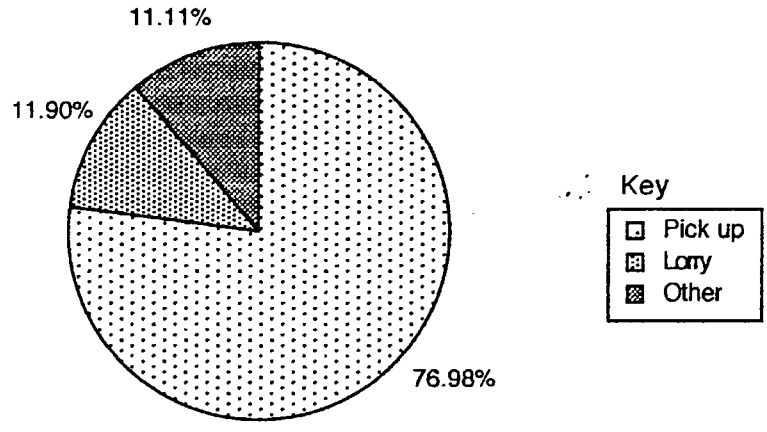
Table 5.9 Analysis of Variance of The Number of Years Traders Have Been in Business Broken down by the Source of Their Produce

Category	Sum	Mean	Standard Deviation	Sum of Squares	Cases
Kariakoo	339	3.49	4.33	1796.25	97
Dar es Salaam	167	3.80	5.056	1099.16	44
Outside Dar	65	10.83	6.82	232.83	6
Other	11	2.20	2.59	26.80	5
Within Groups Total	582	3.83	4.62	3155.04	152

Source	*Sum of Square*	*D.F.*	*Mean Square*	*F-Ratio*	*Significance*
Between Groups	318.51	3	106.17	4.98	0.0025
Within Groups	3155.04	148	21.32		

In Dar es Salaam there is a range of transport methods available to traders wishing to take produce they have bought to their market (Figure 5.6). Five main options are available: lorry, pick-up, bus, *mkokoteni* (a hand pushed cart), or 'other', which was generally headload or bicycle. *Mkokoteni* and 'other' account for a combined proportion of 9.5 per cent so these were grouped together with bus (1.6 per cent), to form a total of 11.1 per cent. Pick-ups are the largest category accounting for 77.0 per cent. Lorries are a much smaller category at 11.9 per cent, but when it is considered in terms of the volume of produce lorries are capable of transporting, the role of lorries in the distribution of fruit and vegetables may be underestimated by these proportions.

Figure 5.6 Methods of Transport by Which Produce Arrives at The Retail Markets



The use of buses for traders at the large retail markets in this survey, accounting for 11.1 per cent of the sample, is perhaps not as important as for the retailers selling at small individual sites around the city. Many small traders, typically selling a bag of oranges at the side of the road, take this bag to their selling site each day by bus from Kariakoo, since this method of transport is relatively cheap and efficient. According to Sporrek (1985), where the load to transport is smaller than a pick-up, for example one or two large sacks of fruit, the bus is used to transport goods a similar distance (over about 2 kilometres in and around the city).

Market retailers, however, tend to sell greater quantities of produce, because of their location, and have greater opportunities to pool their resources to hire transport, such as a pick-up, or, alternatively, if they were to buy the produce and hire the transport themselves they will know that there is an expectant market awaiting their return. The cost of hiring a pick-up from Kariakoo to Mwenge at the time of survey was reported to be about TShs 800 to 1,000. In some cases where a retailer has a *duka*, or small shop at the front of the house, which is close to a retail market, the retailer will transport with other market traders from the nearest market and then use a *mkokoteni* to finish the journey. *Mikokoteni* and pick-ups are often seen queueing up, close to retail markets waiting for business such as this.

5.3 The Differences Between Dar es Salaam Retail Markets

The overall mean number of years in business is 2.3, but the range of market means was from 1.2 years in Ubungo to 3.3 in Tandale (Table 5.10). The analysis of variance produced an F-ratio which is significant at the p>=0.0001 level, indicating a strong probability of a relationship between the market place location and the length of time the traders have been in business. This gives a statistical significance to the suggestion in Table 5.4 that Ubungo and Kinondoni traders have less experience than the rest, while Tandale and Mwenge traders are likely to have been in business the longest.

Table 5.10 Analysis of Variance of The Number of Years Traders Have Been in Business by Market Location

Category	Sum	Mean	Standard Deviation	Sum of Squares	Cases
Mwenge	73	2.92	1.22	35.84	25
Ubungo	29	1.16	0.37	3.36	25
Tandale	78	3.25	1.11	28.50	24
Ilala	68	2.72	1.14	31.04	25
Tandika	56	2.33	1.31	39.33	24
Kinondoni	48	1.60	0.72	15.20	30
Within Groups Total	352	2.30	1.02	153.27	153

Source	*Sum of Square*	*D.F.*	*Mean Square*	*F-Ratio*	*Significance*
Between Groups	82.90	5	16.58	15.90	0.0000
Within Groups	153.27	147	1.04		

Table 5.11 shows a cross-tabulation of the responses given to the question of whether the traders specialised in fruit and vegetables only against the traders' market location. The chi-square value of 18.05 is highly significant. This value forces a rejection of the null hypothesis that there is a random distribution of traders selling fruit and vegetables only in each of the markets. This suggests, therefore that there are varying degrees of fruit and vegetable specialisms in each of the markets surveyed. Traders from Mwenge and Ubungo are more likely to be trading in other goods in addition to fruit and vegetables, with about 50 per cent in each case. Observations indicate that the other commodities include salt, paper bags, rice, fish, spices, maize flour. In other markets, the proportions trading only fruit and vegetables range from 79.2 per cent in Tandale to 84 per cent in Ilala. This may reflect common locational peculiarities of Mwenge and Ubungo, both of which are on a main road into the centre of town, as opposed to set back from the main urban arteries. Both are at the terminus of a number of bus services, and both are sufficiently distant from any alternative retailing concentrations for there to be a demand for these other goods. Ubungo is a relatively recently established market, with new retailers. As it matures, it is likely that its location will tend to promote the establishment of a greater degree of wholesaling activities.

The type of transportation employed to bring produce from the source is dominated in the sample by the use of pick-up trucks (Table 5.12). Responses from all but Tandale market indicate that over 60 per cent of each market's traders obtain produce which is transported by pick-up to their retail market. The mean for the overall study is 77.0 per cent with a minimum of 30.8 per cent in Tandale and a maximum of 100.0 per cent in Kinondoni. Tandale and Tandika have a very low response rate to this question. Traders may have been reluctant to answer the question if they suspected the motives of the interviewer, or, alternatively, they may have understood the question to be asking them how they had transported the produce to the market, and not considered the question as applicable to them, if they had purchased from

people who had transported the produce to their market. The latter, according to informants and observations, is more likely to be the case in these two markets.

Table 5.11 Cross-Tabulation of Market Location by Fruit and Vegetable Specialisms

Count *Expected Value*	Fruit & Veg.	Others	Row Total
Mwenge	13 *16.6*	10 *6.4*	23 15.3%
Ubungo	11 *18.0*	14 *7.0*	25 16.7%
Tandale	19 *17.3*	5 *6.7*	24 16.0%
Ilala	21 *18.0*	4 *7.0*	25 16.7%
Tandika	19 *16.6*	4 *6.4*	23 15.3%
Kinondoni	25 *21.6*	5 *8.4*	30 20.0%
Column Percent	108 72.0%	42 28.0%	150 100.0%

Chi-Square	18.05
Degrees of Freedom	5
Significance	0.0029

Ubungo, Tandale, Ilala and Tandika markets are all located on or close to the main arterial routes entering Dar es Salaam, such as Kilwa Road, Morogoro Road and Nelson Mandela Road (Figure 3.1) These are the only four markets where lorries are specified as a method by which produce is transported to the retail market place, as can be seen in Table 5.12. Lorries are only generally economically viable for transporting large quantities of produce over long distances (Mbilinyi and Mascarenhas, 1973; Temple, 1969). Meanwhile Kinondoni, Mwenge and Ubungo have the highest proportion of deliveries transported by pick-up, over 80 per cent in each case. This reflects a heavier dependence on the sources in and around the city in these market places, since pick-ups are generally only viable for transporting over relatively short distance, such as up to 25 km (Mascarenhas and Mbilinyi, 1969). The distribution of frequencies was such that a chi square test for relationship between these variables was not possible.

Table 5.12 Cross-Tabulation of the Market Location by the Method of Transportation

Count *Expected Value*	Lorry	Pick-up	Other	Row Total
Mwenge	0 *2.9*	21 *18.5*	3 *2.7*	24 19.0%
Ubungo	2 *2.9*	20 *18.5*	2 *2.7*	24 19.0%
Tandale	7 *1.5*	4 *10.0*	2 *1.4*	13 10.3%
Ilala	2 *2.7*	14 *17.7*	7 *2.6*	23 18.3%
Tandika	4 *1.4*	8 *9.2*	0 *1.3*	12 9.5%
Kinondoni	0 *3.6*	30 *23.1*	0 *3.3*	30 23.8%
Column Percent	15 11.9%	97 *77.0%*	14 *11.1*	126 100.0%

The cross-tabulation in Table 5.13 highlights the dichotomy of market functions. According to the market survey, Mwenge, Ubungo, Ilala and Kinondoni have very strong consumer-oriented traders, with between 82.6 per cent, in Mwenge, and 100 per cent, in Ilala, selling direct to consumers. In contrast, Tandika and Tandale maintain their consumer-oriented business, but have a relatively strong trader-oriented, or wholesaling component, with between 66.7 and 83.3 per cent of traders involved in wholesaling. Table 5.13 has a highly significant chi-square value at the p>=0.00001 level, which confirms that there are differences between the markets. There is an overall mean proportion of traders selling to consumers of 70.9 per cent, with a minimum of 16.7 per cent in Tandika and a maximum of 100 per cent in Ilala. These latter two proportions, however, are exaggerated since although 20 respondents, or 13 per cent, specified Tandika as their main source, it is primarily a retail market. In the case of Ilala, only 2 respondents, or just over 1 per cent of all respondents specified it as the main source of their produce. This suggests that Ilala cannot sell 100 per cent of its produce to consumers, and in Tandika 16.7 per cent of consumer-oriented selling is a low proportion for a market which is primarily considered as retail. In addition to this, Ilala had temporary status as a wholesale market while Kariakoo market complex was under construction in the mid- to late 1970's. It seems surprising, therefore, that such an extreme range should exist in the survey.

Table 5.13 Cross-Tabulation of the Market Location by the Type of Customers to Whom the Traders Sell

Count *Expected Value*	Other Customers	Consumers	Row Total
Mwenge	4 *6.7*	19 *16.3*	23 15.2%
Ubungo	1 *7.3*	24 *17.7*	25 16.2%
Tandale	16 *7.0*	8 *17.0*	24 15.9%
Ilala	0 *7.3*	25 *17.7*	25 16.6%
Tandika	20 *7.3*	4 *17.0*	24 15.9%
Kinondoni	3 *8.7*	27 *21.3*	30 19.9%
Column Percent	44 29.1%	107 70.9	151 100.0%

Chi-Square	75.30
Degrees of Freedom	5
Significance	0.0000

Table 5.14 is a cross-tabulation of the sources of the produce against the market place. Mwenge, Ubungo, Ilala and Kinondoni emerge as distinct from the other two markets in their preference for Kariakoo as a source. Out of these four, Ubungo is the only market where traders say that they get their produce from sources outside the main Dar es Salaam markets.

In the case of Ubungo market, there were two traders who gave the area of Ubungo as their source of produce, suggesting that they buy from producers in this peri-urban area, where the author did observe some informal production on small, otherwise vacant plots of land takes place.

Table 5.14 Cross-Tabulation of the Market Location by the Source of Produce

Count *Expected Value*	Kariakoo	Other	Row Total
Mwenge	17 *15.3*	7 *8.7*	24 15.8%
Ubungo	21 *16.0*	4 *9.0*	25 16.4%
Tandale	6 *15.3*	18 *8.7*	24 15.8%
Ilala	19 *16.0*	6 *9.0*	25 16.4%
Tandika	6 *15.3*	18 *8.7*	24 15.8%
Kinondoni	28 *19.1*	2 *10.9*	30 19.7%
Column Percent	97 63.8%	55 36.2%	152 100.0%

Chi-Square	49.17
Degrees of Freedom	5
Significance	0.0000

A chi square test of relationship between the market location and the source of produce suggests a statistical relationship between the two variables. In both Tandale and Tandika, 75 per cent of the respondents gave an alternative to Kariakoo as their main source of produce. Tandale and Tandika are already acknowledged to have commodities being delivered from outside Dar es Salaam, and the author frequently observed lorries, having travelled from locations some considerable distance to Dar es Salaam, arriving at Tandale market delivering fruit and vegetables, as well as staples. In addition to these sources, there were three respondents (two traders selling at Tandika, and the one at Tandale), who gave "their own farm" as their main source of supply.

The overall mean proportion of traders giving Kariakoo wholesale market as their main source of supply is 63.9 per cent. In those markets other than Tandika and Tandale, most traders gave Kariakoo as their main source of supply, between 70.8 per cent in the case of Mwenge, and 93.3 per cent in the case of Kinondoni. These figures highlight the difference which exists between the two 'wholesaling' markets, Tandale and Tandika, and the other markets surveyed. However, interviews with the market officials, who had little to lose by telling the author where they thought the main sources of produce were, indicated that Tandika was receiving oranges, mangoes and pineapples from the south of Tanzania; Tandale was receiving oranges, tangerines and other citrus fruits from Tanga and Morogoro Regions; Buguruni, a market on the Nelson Mandela Road, receives oranges from Kisarawe and other areas to the south-west of the city; Ubungo was receiving cooking bananas from Coast Region and to the south west of the city; and Mwenge obtained tomatoes and some fruits, when in season, from the peri-urban

areas around the market and just beyond the city boundary, near Kunduchi. This perhaps indicates that the search for alternatives to Kariakoo as a source of produce is selective depending on the type of produce involved. Finally, the fact that such a varied number of sources have been quoted to the author, in some cases by the same trader, suggests that the sources of produce are not fixed. Traders and observers, such as market secretaries and some consumers, report that retailers compare the relative price, quality and supply of commodities between sources. Their final purchase arrangements depend on the assessment of the relative benefits of purchasing from one market or another.

5.4 Conclusion

This chapter has demonstrated that Tandale and Tandika markets distinguish themselves from the other markets as important wholesale centres. Both markets are relatively large, established retailing markets located on two of the main road arteries entering the city. They are located in the midst of relatively large residential areas, but not far enough into the city to experience the same high levels of traffic congestion around Kariakoo market and the city centre. However, the other markets also have traders involved in wholesaling. It seems that in the retail markets surveyed there are different categories of traders, such as retailers, wholesalers, of which there are only a small number, and those who are involved in both retailing and wholesaling.

Most produce which enters Dar es Salaam goes to a wholesale market, of which we can identify three major ones, Kariakoo, the only legal one, Tandika and Tandale. In addition, Ubungo and Ilala have a small number of traders whose produce is primarily delivered by lorry. This indicates some level of wholesaling activities in these markets.

Kinondoni and Mwenge are slightly different again, with no traders whose produce arrives at their market by lorry. In addition, there is limited direct trade contact with areas outside Dar es Salaam. These two markets may be considered as slightly more quality-oriented, with Kinondoni, known as the 'TX Market'[1] because of the number of expatriates that shop there, and Mwenge, being so close to the University of Dar es Salaam and a large army base. Both markets are situated away from the main national routeways, which are most likely to channel fruit and vegetable supplies in from the important producing areas.

The pick-up is the most important method by which fruit and vegetables are transported to the market place except in the case of Tandale, where this is the lorry. A significant proportion of produce (26 per cent) arrives at Ilala by *mkokoteni* , a similar proportion (24 per cent) of Ilala traders use Kariakoo as their main source of produce. Kariakoo is the most important source of produce with overall, 63.8 per cent of traders obtaining goods from there, but between markets this ranges from 25 per cent in Tandika and Tandale to 93.3 per cent in Kinondoni.

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1 'TX' is the code mainly used for licence plates of expatriate-owned vehicles in Tanzania.

Those traders with more years in business are more likely to be involved in wholesale trading, while those with one year or less are most likely to be primarily retailers. In addition, Tandale had the highest mean number of years in business followed by Mwenge and then Tandika. The lowest mean number of years in business were recorded in Ubungo and Kinondoni.

There is evidence of a significant number of traders who have recently (within the last five years) begun trading in fruit and vegetables. It is too early to establish, with confidence, the reason for this, but there are suggestions that the liberalisation of the staple markets attracted some experienced fruit and vegetable traders to invest in this new market. It appears the new traders in fruit and vegetables have moved in to replace them.

Selected fruits and vegetables, such as oranges, tangerines, bananas and tomatoes are clearly by-passing Kariakoo. They are being dealt with in the main retail markets around Dar es Salaam. Each market has built up a specialism, so that they are known for particular fruit or vegetables, such as Tandale being known for oranges, Ubungo for bananas, Tandika for pineapples and citrus. These specialisms can be explained as the result of the geographical location of the market places, in relation to the incoming traffic from the main supply areas.

Chapter Six

Fruit and Vegetable Traders' Survey

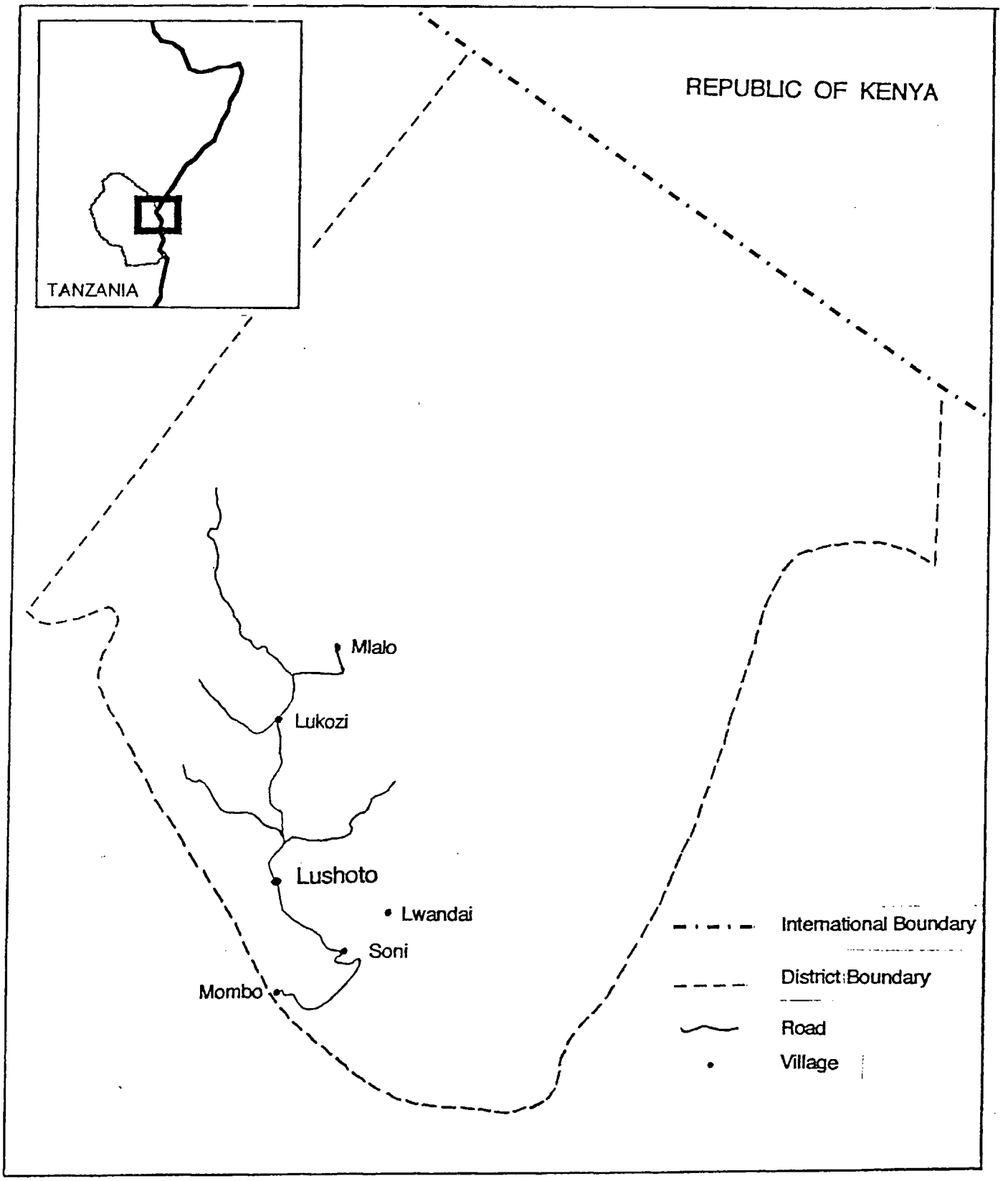
6.1 Introduction

This chapter focuses on traders involved in the wholesale supply of fruit and vegetables for the urban market of Dar es Salaam. This will be carried out using results of a questionnaire survey of wholesale traders operating in the Lushoto District of Tanga Region, designed by the author and carried out in August 1989 (see Appendix 3.3). This survey was administered in Swahili by a Tanzanian assistant in order to overcome the language barrier. The purpose of the survey was to build a profile of the trading activities of those traders who actively buy fruit or vegetables from the Lushoto producers with the intention of transporting the produce to an urban market. The most practical method of interviewing traders was to meet them while at work at the periodic markets in the District. These markets take place every day in a different village, so that any one village will host a market every three or four days. The main purpose of the markets is for the exchange of goods among rural farming households, but they are also used by traders to meet farmers and negotiate their wholesale purchases. Three periodic markets were visited near to Lushoto: Lukozi, Soni and Mlalo.

6.2 The Traders Survey

It is difficult to estimate accurately the number of traders actively engaged in the wholesale trading of fruit and vegetables. There is considerable overlapping of roles, where, on the one hand, farmers who may have business in one of the main towns, may take some of their own and perhaps their neighbours' produce with them to sell. On the other hand, most of the traders (over 70 per cent) interviewed were also part-time farmers. In addition, all the individuals interviewed said that it is very common for anyone travelling out of the area for any reason to buy locally-produced commodities for sale elsewhere. They also return with commodities which are not expensive or not generally produced in the area to sell. These include cigarettes, matches, kerosene, soap and cloth. This level of informal trading ranges from full-time traders to those who make the occasional trip, combined with some trading activities in order to supplement incomes, or, in some cases, to defray the cost of a business trip. The evidence from interviews with local informants suggests, however, that most large wholesalers, purchasing from Lushoto producers, meet the farmers at the periodic markets held in most villages in the district at least once per week. It is for this reason that this study has concentrated on those traders active at the periodic markets. Interviews with the traders and some producers suggest there are traders who come to the District from elsewhere; for example, from Dar es Salaam or Arusha. Their visits tend to be irregular and speculative, so

Figure 6.1 Lushoto District of Tanga Region
(Indicating the villages surveyed)



this is not a very reliable form of trading, and, consequently, those participating in it are very difficult to meet and interview.

The survey included twenty-two males and eight females. Table 6.1 is a contingency table of location of trader by gender. This shows a mearked split between Soni and Lukozi on the one hAnd and Mlalo on the other. The first two are located on the main road through the District while Mlalo is some distance off this road. The cross-tabulation of gender by method of transportation in Table 6.2 confirms that female traders use the category 'other', which represents the use of either buses or carrying their produce as a headload, whereas male traders tend to use hired vehicles. In an interview with the Lushoto market secretary, he explained that it is considered unseemly for women to be involved in such activities as hiring and loading pick-ups or trucks. This leaves women with the options only of carrying by headload, or going by bus, where larger loads are involved. It is clear that attitudes such as this have restricted women's involvement in fruit and vegetable trading, except where they are retailing their own produce on a small scale. It would appear that around Lushoto women generally are responsible for providing the household with food, while men are more responsible for cash dealings with traders. This interpretation is paralleled by Sender and Smith (1990, p.66) reporting that "cash incomes from sales of food crops in local markets was generally said to be divided equally between husband and wife, although women acknowledged that their closer involvement in production and marketing provided them with some ability to manipulate shares." However, cash income from tea and coffee sales all accrued to the husband in spite of the fact that "the overwhelming majority of manual agricultural labour is done by women" (p.66). In the case of large cash sales of fruit and vegetables, considered as cash crops in Lushoto, the economic benefit of sales of large quantities to traders also accrues to the husband. This is in contrast to some countries of West Africa, where women have obtained virtual control over the fruit and vegetable marketing (Lawson, 1967). Photograph 4.1 shows women in the main part of Soni's periodic market, retailing small quantities of mainly staples, but also some fruit and vegetables, which they themselves have produced. The wholesale traders, who are mainly male, are to be seen around the fringes of the market, buying or selling wholesale commodities and re-packing produce in preparation for loading onto the lorries.

Table 6.1 Cross-tabulation of the Market Place by the Gender of Respondents

Count *Expected Value*	Male	Female	Row Total (Column %)
Soni	14 *11.0*	1 *4.0*	15 (50.0%)
Lukozi	8 *5.9*	0 *2.1*	8 (26.7%)
Mlalo	0 *5.1*	7 *1.9*	7 (23.3%)
Column Total Percent	22 73.3%	8 26.7%	30 (100.0%)

Table 6.2 Cross-tabulation of Method of Transport by Gender

Count *Expected Value*	Hired Vehicle	Bus	Row Total (Column %)
Male	21 *15.4*	0 *5.9*	21 (72.4%)
Female	0 *5.6*	8 *2.1*	8 (27.6%)
Column Total Percent	21 70.0%	8 26.7%	29 (100.0%)

There is an important social dimension to women's participation in marketing in Lushoto. Women frequently carry produce on foot for long distances in order to take part in the market day. In some cases, a woman, who has none of her own produce to sell, may buy from her neighbours, and may even sell her produce at a loss, in order to attend a particular market. The periodic market forms a focus around which many of the issues important to village life may be resolved. For example, loans are often arranged, recalled and paid back at the market, disputes may be settled with the help of village officials, and news and information about what is happening in and around the village may be discussed at the market. Consequently, missing a periodic market may mean missing out on far more than the opportunity to buy or sell produce.

In view of these clear gender differences, it is possible that some interview bias has resulted in the over-representation of women as wholesale traders in this study. Clear examination of their questionnaire forms shows that they are all involved in the trading of relatively small quantities of local staple foods. They, therefore, consider themselves as wholesale traders, although they are prevented from dealing in larger quantities by the cultural forces which exclude them from the use of larger transportation facilities. This raises the important point of how the traders perceive themselves in relation to other traders in the market. Clearly, traders interviewed in Mlalo consider themselves as wholesalers, and in one sense they are, since they appear to be buying from producers and selling to other traders. However, the locations of their sales and the volumes of produce they are dealing suggest that they are operating on a far smaller scale than the traders who purchase commodities for exporting out of the District. These traders may even operate as middle agents purchasing from producers and selling to larger traders.

Table 6.3 Mean Age of Respondents

Market Location	Mean Age
Soni	31.5
Lukozi	29.5
Mlalo	33.3
Total	31.4

Table 6.4 Cross-tabulation of Market Location by Number of Years Schooling of the Respondents

Count *Expected Value*	Less Than Six	Seven	Eight or more	Row Total (Column %)
Soni	6 *6.0*	7 *7.5*	2 *1.5*	15 (50.0%)
Lukozi	2 *3.2*	5 *4.0*	1 *0.8*	8 (26.7%)
Mlalo	4 *2.8*	3 *3.5*	0 *0.7*	7 (23.3%)
Column Total Percent	12 40.0%	15 50.0%	3 10.0	30 (100.0%)

The traders interviewed had an overall mean age of 31.4, with little variation between markets (Table 6.3). Approximately half of the survey have had seven years schooling, that is, full primary level education. 40 per cent have received less than seven years, and only three traders (10 per cent) received more. This represents a relatively highly educated group of the population, 50 per cent of which have received seven years of primary school education, compared with the population of Tanga Region, of which, in 1984, only 10.2 per cent had received seven years of primary education (TIRDEP, 1985). The level of education did not differ significantly between the traders interviewed in the different village markets (Table 6.4). For most respondents, trading in fruit and vegetables appears to be a natural extension of farming, since all those who did indicate a second job indicated farming; approximately 77 per cent of the traders interviewed were also farmers. These proportions did not differ significantly between village markets (Table 6.5).

Table 6.5 Cross-tabulation of Part-time Farmers by Market Location

Count *Expected Value*	Part-Time Farmer	Not p/t Farmer	Row Total (Column %)
Soni	11 *11.5*	4 *3.4*	15 (50.0%)
Lukozi	8 *6.1*	0 *1.9*	8 (26.7%)
Mlalo	4 *5.4*	3 *1.6*	7 (23.3%)
Column Total Percent	23 76.7%	7 23.3	30 (100.0%)

Figure 6.2 shows the number of employees the respondents employ. Employees are mainly taken on for labouring jobs, such as carrying, packing and possibly cleaning. This barchart demonstrates that the majority (some 63 per cent) work alone. Those employing anyone account for 37 per cent, and out of this proportion almost 17 per cent employ only one person. It is not clear from this what level of employment is involved, whether it is full-time, part-time, temporary, piece-meal or even family labour. The implications of this are that it is unclear how important employment is to the trading activities of the respondents. This level of detail would require a more detailed survey than was possible here. However, we can see from these data

that the majority of the traders buying produce from the Lushoto District markets for shipment to the main urban markets are small scale traders working alone. This suggests that the trade is operating on extremely tight margins, and is likely to be susceptible to adverse changes in the economic climate. All the traders depend on their earnings to provide their households with the consumer goods, although a large proportion are still closely tied to their farms. This would suggest that if the economic situation worsened, they would continue to attempt to trade in order to bring in cash, but ultimately, if the costs became too high, and the prices of consumer goods increased, or their availability diminished, the traders are likely to be able to survive on a subsistence basis by devoting more of their time to their farms.

Figure 6.2 The Number of Employees Used by The Respondents

Figure 6.3 shows that the most important types of crop traded by the respondents are vegetables, accounting for 52.6 per cent of the commodities they listed. Fruit accounts for 35.1 per cent, while staples and pulses account for only 12.4 per cent. In a rural area such as Lushoto, a high proportion of the staples consumed in the household are grown on the household farm as subsistence crops, especially maize, yams and, increasingly, Irish potatoes. Furthermore, these staples have only recently been freed of monopoly marketing controls. The newly liberated market is intended to provide traders with a greater freedom of choice about who to buy from and sell to. It is intended that these liberated economic conditions will release the government from the enormous financial burden of the National Milling Corporation's running costs, discussed earlier. It is also intended to ensure efficient, cost-effective flows of commodities between producers and consumers, benefiting both by increasing producer prices and reducing consumer prices. As discussed earlier, the reality is not as clear-cut as this. The cross-tabulation in Table 6.6 shows that of the traders interviewed in this survey, all the female traders and only four out of the twenty-two male traders indicated that their most important crop type was a staple. The same proportion of men indicated that pulses are their most important trading crop, while the largest proportion of the overall sample (47 per cent), or fourteen men, gave vegetables as their main trading crop.

Figure 6.3 Types of Crop Bought by The Respondents

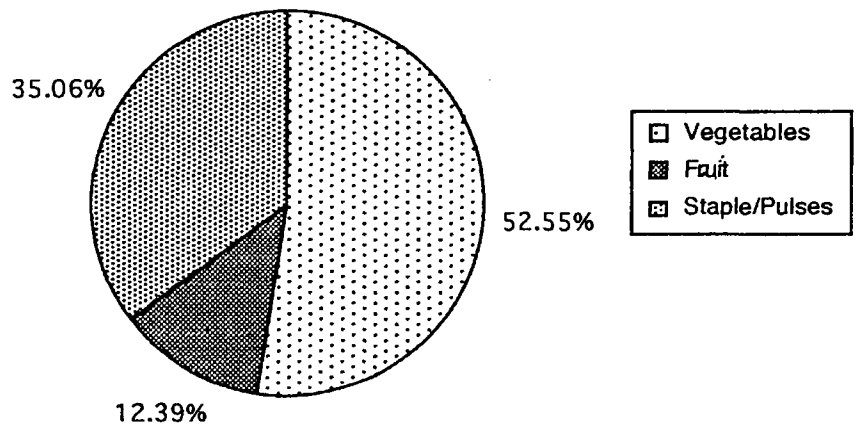


Table 6.6 Cross-tabulation of Most Important Crop by Gender

Count *Expected Value*	Vegetable	Pulses	Staples	Row Total (Column %)
Male	14 *10.3*	4 *2.9*	4 *8.8*	22 (73.3%)
Female	0 *3.7*	0 *1.1*	8 *3.2*	8 (26.7%)
Column Total Percent	14 46.7%	4 13.3%	15 40.0%	30 (100.0%)

As can be seen from the questionnaire form (Appendix 3.3), traders were asked to give an example of the volume and price of a purchase of each of the commodities in which he or she would normally deal. For the purposes of the following discussion these will be referred to as 'batches'. Traders were asked to indicate the crops in order of the importance for their business (Tables 6.7 and 6.8). Some 46.7 per cent of respondents indicated that vegetables were their most important crop type, with 13.3 per cent naming pulses and 40 per cent staples. None of the respondents considered fruit as their most important commodity.

Table 6.7 The Crops Traders Indicated as Their Most Important Grouped into Types

Crop Type	Number of Traders	Percent
Vegetables	14	46.7
Staples	12	40.0
Pulses	4	13.3
Fruit	0	0.0
Total	30	100.0

Table 6.8 sets out the crop types of all the batches reported by traders. This is subtly different, as it groups all of the crop types dealt with regardless of priority, and it yields subtly different results. Vegetables account for 52.6 per cent of all the crop batches reported, and staples and pulses account for a combined proportion of 35.1 per cent, while fruit accounted for 12.4 per cent. Clearly, fruit is a more important trading crop than may be suggested by Table 6.7. In interviews with key informants the advantages of growing staples were reported to be that if there was to be a general harvest failure, or there were marketing difficulties, at least the trader and his or her household could eat what they had grown or bought, and store a considerable portion for later consumption or sale. It is also likely that in a highly populated area such as Lushoto, staples would be in constant demand. On the whole, fruit trees, are considered more of an unnecessary hindrance. The trees take up valuable land and much of the produce does not get to market, because of the problems of high perishability, of over-production (particularly of pears) and low demand, and a high quality is required for the market. The result is that although the staples do not have such a high profile in terms of sales, they are considered important by the traders, because of their strategic value, while fruit is relatively less important, despite the over-production of temperate fruit and the suitability of the area to the production of this type of fruit.

Table 6.8 All The Crops Reported By the Traders in Their Transactions

Crop Type	Number of Batches	Percent
Vegetables	51	52.6
Staples/Pulses	34	35.1
Fruit	12	12.3
Total	97	100.0

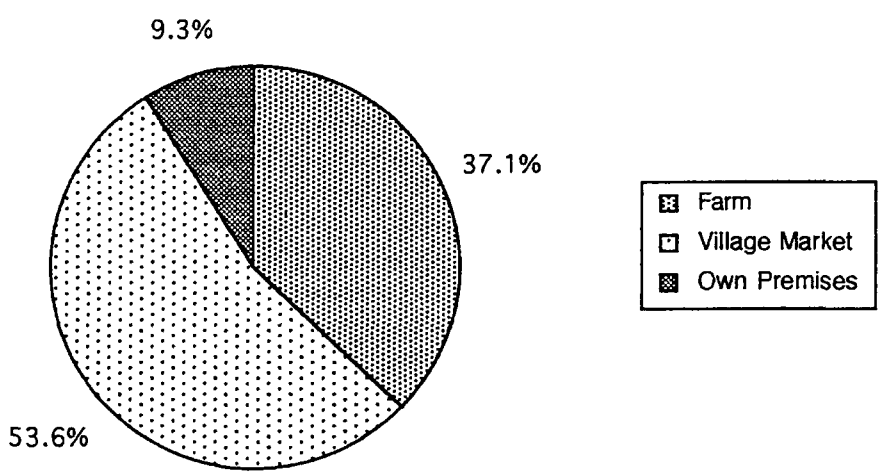
Table 6.9 gives a breakdown of the number of crops handled by each trader. This table shows a relatively even spread, with a significant proportion (23.3 per cent) dealing with only one commodity and the same proportion dealing with as many as six or more commodities. Traders who concentrate on a small number of commodities tend to deal with a small range of crops, for example the traders in Soni and Lukozi dealing with four crops or less tend to concentrate on tomatoes, cabbage and potatoes, occasionally with a fruit of some sort, such as jack fruit. Traders in Mlalo dealing with such a small number of crops tend to concentrate on bananas and millet, with cassava and beans. Traders dealing with four or more commodities tend to be based in either Soni or Lukozi; only one Mlalo trader deals with as many as three commodities, while only in Soni do traders deal with more than five commodities. This pattern of trading is likely to arise from the level of contact each of the village markets has with the outside and the ability of the surrounding area to produce a range of commodities to meet the needs of the external markets. The environment around Mlalo is not as well-suited to the production of such a wide range of crops as that around Soni and Lukozi. The latter two markets also benefit from their more convenient location for transporting crops out of the District.

Table 6.9 The Number of Crops Handled by Each Trader

Number of Crops Handled	Number of Traders	Percent
One	7	23.3
Two	5	16.7
Three	6	20.0
Four	5	16.7
Five	0	0.0
Six and over	7	23.3
Total	30	100.0

Figure 6.4 shows the proportion of commodity batches bought at different locations; 53.6 per cent were purchased at the periodic village markets, 37.1 per cent were bought at the producers' farm, and only 9.3 per cent originated from the traders' own farm. This clearly demonstrates the importance of the periodic markets as the location for carrying out transactions for these traders. The cultural importance of the periodic market to the people of Lushoto suggests that the traders, knowing that a large proportion of the local producers will attend the market, come in search of produce there. Interviews with agricultural extension workers and village officials confirm that the majority of trading is, in fact, carried out through the periodic markets, and that produce which by-passes this channel is only a relatively small proportion in Lushoto. These other channels comprise the following: large producers who have a contract with a buyer, or who produce in sufficient quantities for viability in hiring lorries for themselves and trade their own produce in an urban market; or urban-based buyers who make speculative purchases.

Figure 6.4 Location of The Traders' Purchases



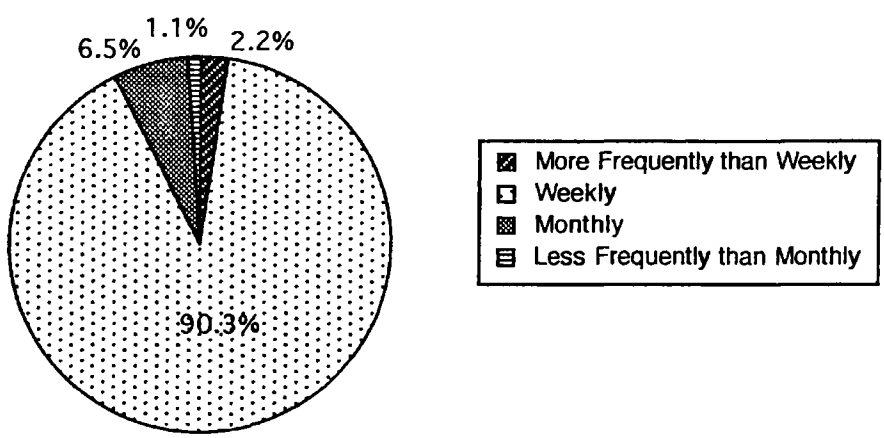
It is important at this stage that the process of purchasing is understood. The farmer and trader may meet at the periodic market, or at an alternative pre-arranged meeting, in order to negotiate a deal. The farmer may bring the produce to the meeting or may bring a sample for the trader to check. If a sample has been brought by the farmer, the trader may agree to

collect the rest of the harvest later at the farmer's field, once transport has been arranged. This, however, leaves a degree of ambiguity, for the purposes of the questionnaire, about the location of the trader's purchase. The purchase may then be seen as occurring when the agreement is reached, at the pre-arranged meeting, or it may be at the exchange of money and goods, at the producer's farm. In order to clarify this and the importance of the variety of processes of purchase which are employed, a more comprehensive survey than could be carried out here is required.

In addition, a fourth method of purchase exists, although this is not as common in Lushoto District as in the coconut, orange and mango producing areas in the lower altitude areas of Tanga Region. In this process the trader rents the farmer's land at the time of harvest and arranges for the harvesting himself. This reduces the amount of labour required by the farmer and, therefore, the initial capital investment normally required by producers for the costs of harvesting.

The greatest proportion of traders (90.3 per cent) purchase their commodities on a weekly basis, with only 6.5 per cent purchasing more frequently and 3.3 per cent less frequently (Figure 6.5). Caution, however, must be exercised when interpreting this result. The traders may only be referring to their work at the time of the questionnaire survey, even though the questions were framed in a more general way. In this case, seasonal variations in the size, frequency and type of traders' purchases can be expected to have some influence on the results of this survey. The survey was carried out in July, consequently the transactions which the traders were making at that time would be uppermost in their minds. The corollary of this is that transactions they had negotiated six or nine months previously will tend to be less accurately recalled.

Figure 6.5 Frequency of Traders' Purchases



90.7 per cent of the produce reported in the questionnaire was purchased directly from the producers (Figure 6.6). This leaves 9.3 per cent to be purchased from some other form of middle agent, such as other traders (5.2 per cent) and 'others' (4.1 per cent), which may include the more informal, infrequent traders described at the start of this section.

Figure 6.6 The People From Whom The Traders Purchase Their Produce

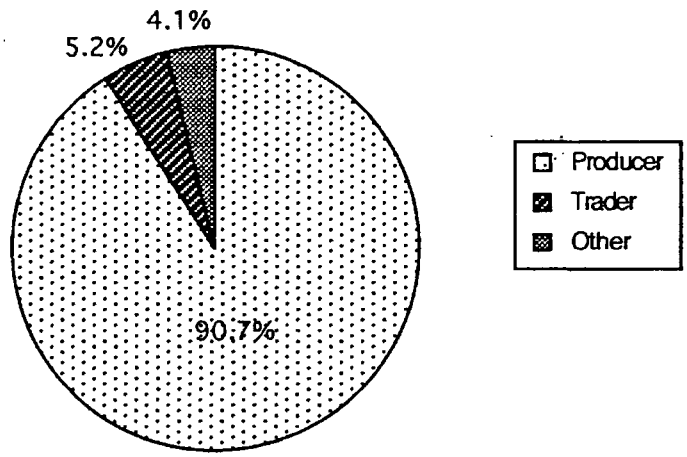
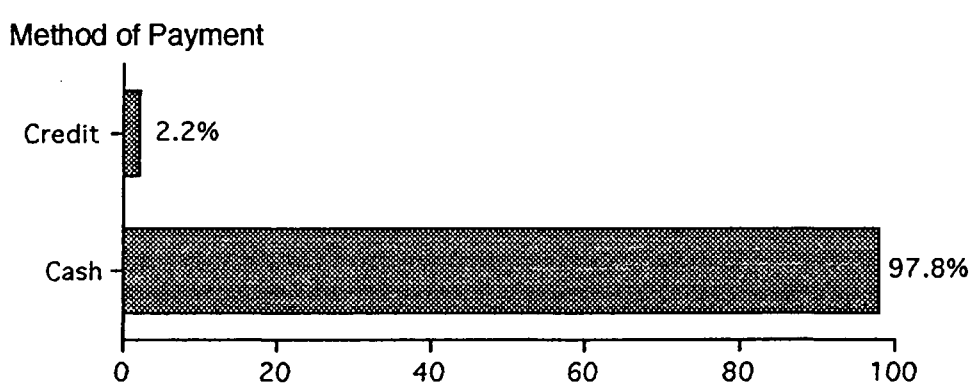


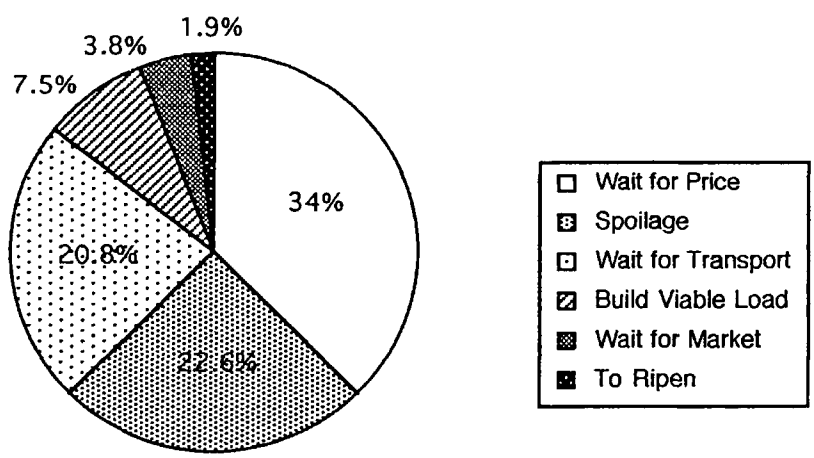
Figure 6.7 shows that the greatest majority of the batches of crops reported by the traders (97.8 per cent) were paid for in cash. Only 2 batches used credit. Credit is very rarely used in the purchase of fruit and vegetables in Lushoto. According to one local business man, farmers in Lushoto rarely use credit because they have no collateral against which to borrow: most farmers rent or lease the land they work and have no other property with which to secure a loan. Indeed, it appears that credit is only generally used between family members. However, close family ties in the area and the approximately 50 per cent level of out-migration among the 18 to 35 year old males (Sender and Smith, 1990), suggest that some credit may be obtained through cash-earning out-migrants. The result of this is that traders must generate a significant amount of initial capital, usually through family relations, with which to make purchases of fruit and vegetables in the Lushoto area. In addition, they have to hire transport in order to take the produce they have purchased to the market where they intend to sell. Interviews with two business people in the Lushoto area, however, suggest that lorries may in some cases be hired on credit and paid for once the commodities are sold at the destination market. In other words the lorry owner will provide the lorry, driver and fuel in advance, on the understanding that the trader will pay the hire on return from the destination market.

Figure 6.7 Methods of Payment



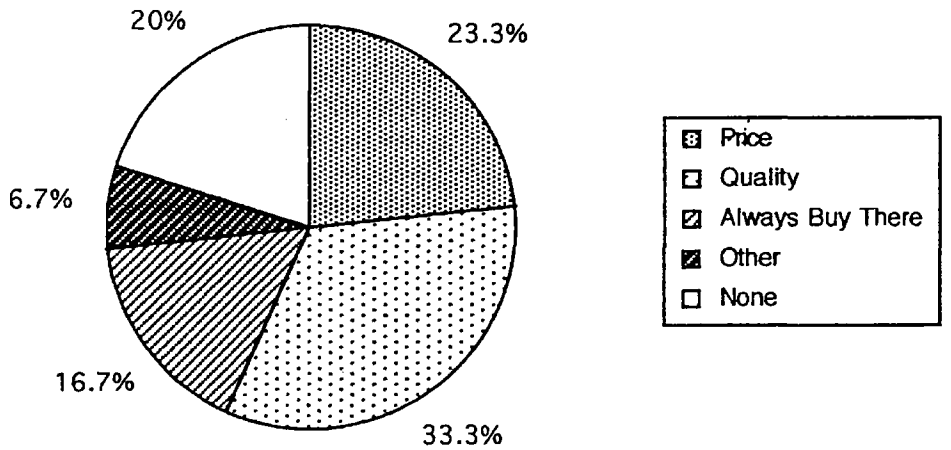
Traders were asked to identify the most important factor in their decision to buy from one producer or another; 20 per cent gave no reason, while of those who gave a reason (Table 6.8) 33.3 per cent rated quality of produce as the most important factor in selecting a supplier and 23.3 per cent rated the price of the commodities as the most important factor. 16.7 per cent said they always bought from the same person, while only two respondents gave 'other reasons'. One of these traders reported that he buys from the same person because he can purchase on credit, the other reported that he purchases small quantities from a large number of producers and rarely tries to return to the same producer. The quality-price trade-off ranks highly, as would be expected, but it is surprising that such a high percentage always buy from the same producer. The advantage of this, however, is that this simplifies the trader's job by dealing with a supplier he knows and presumably trusts. Interviews carried out in the District suggest that this arrangement more often exists between neighbours or relatives, although the importance of the "blood brother network" in social and economic behaviour in Lushoto, reported by Sender and Smith(1990), may also provide the basis for such an arrangement.

Figure 6.8 Decision-Making Factors When Traders Select From Whom to Buy



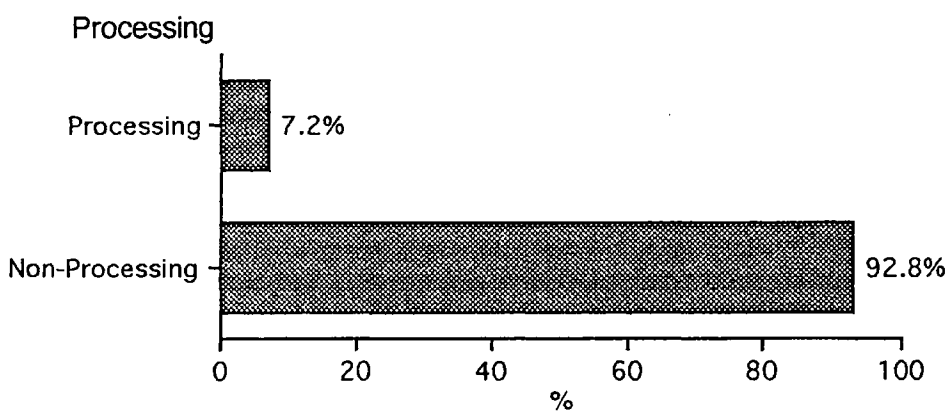
48.5 per cent of the batches of crops reported by the respondents have been stored by them before selling. The mean storage time is 6.7 days, although the maximum is ninety-nine days and the minimum is one day. Figure 6.8 illustrates the reasons why these crops have been stored: 34 per cent are put in storage to wait for a better price; 22.6 per cent to prevent crops from being spoiled, although the traders did not explain the delay between purchase and re-sale that required them having to be kept long enough for storage to be necessary; 20.8 per cent were stored while waiting for transport to a market. The last two reasons account for relatively small proportions of the sample: two respondents to wait for the market day and one respondent to allow the crop (bananas) to ripen.

Figure 6.9 Reasons Why Traders Store Their Produce



The survey shows that 92.8 per cent of the batches reported were not processed in any way by the traders (Figure 6.10). The 7 per cent remaining, including potatoes, cabbages, tomatoes, pears, apples, bananas and cassava, had simply been cleaned before resale. Most traders, however, repack all their crops to make loads more suitable for long distance lorry journeys and for the portering at the end of the journey.

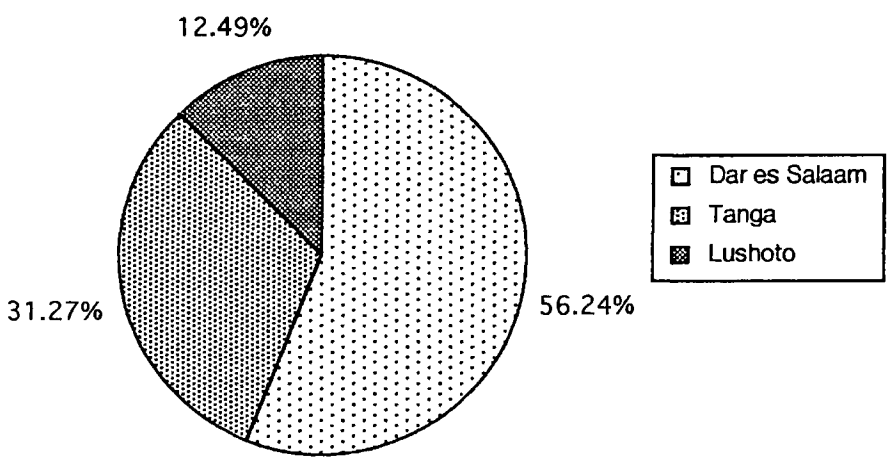
Figure 6.10 The Proportion of Traders Who Process the Foods They Deal With



The possibility of a more fundamental form of processing has been discussed in Lushoto for a number of years. A small tomato canning plant currently exists in Soni village, although it has had considerable supply and operational problems. The most recent contribution to the debate is a consultants' report in 1987, assessing the feasibility of producing an alcoholic liqueur from the unused fruit that is produced each year in the District (Schaeffer and Jenders, 1987). This investigation looked particularly at pears as a raw material for the liqueur. Pear trees were

originally planted in the area under the instructions of the colonial government, but there is no longer the demand for pears, although the trees continue producing them, despite the neglect of farmers. The result is a very large stock of unkempt pear trees, which are estimated to produce about 100,000 metric tonnes per year. Only 20 per cent of this is sold or consumed. The remainder is allowed to fall off the trees and rot on the ground. Because the pear trees are unkempt, the quality of pears is relatively poor, however, Schaeffer and Jenders (1987) report that the introduction of suitable husbanding would rapidly improve the quality of the fruit. A company has been formed in Lushoto and most of the relevant permits and licences have been applied for or already obtained, but, as yet, the investment has not been forthcoming. A resident in Lushoto is known to produce an alcoholic drink from pears, following a recipe brought to the area by the colonial settlers. It is thought, however, that the recipe would not lend itself to large-scale production, because of the complications in fermenting the particular type of sugar which pears produce.

Figure 6.11 Destination of Lushoto District Produce Bought By The Traders



The largest proportion of crop batches reported (55.7 per cent) were to be sent to Dar es Salaam (Figure 6.11). Tanga, as regional capital, also figures prominently as a destination of Lushoto's produce, accounting for 30.9 per cent. Finally, Lushoto town itself has a significant proportion of non-agricultural inhabitants who require fruit and vegetables and, indeed other food crops, which can be supplied from the District, and this accounts for 12.4 per cent of the batches reported.

The most important method of transporting crops to the market where they are to be sold was a hired vehicle, accounting for 88.7 per cent of the reported batches (Figure 6.12). A further 9.7 per cent were accounted for by a obtaining a lift from passing traffic. 2.1 per cent indicated 'other' methods of transport, which include either bus or headload. Observations made by the

author on bus journeys from the supply areas into Dar es Salaam, and interviews with some farmers suggest that the bus is generally only used by farmers transporting their own produce rather than by traders. The reasons for this are clear. A farmer who has produced his own fruit is able to miss out the middle agent by travelling into the urban market to sell the produce to retailers himself. On the other hand, a trader who makes most of his living from trading would require large loads to make a trip to an urban market a viable option. In this case, transport by bus would not allow enough space to carry a sufficient load, and the unit costs of transport are likely to be higher than hiring a lorry for bulk transportation.

Figure 6.12 Methods of Transport Used By the Traders

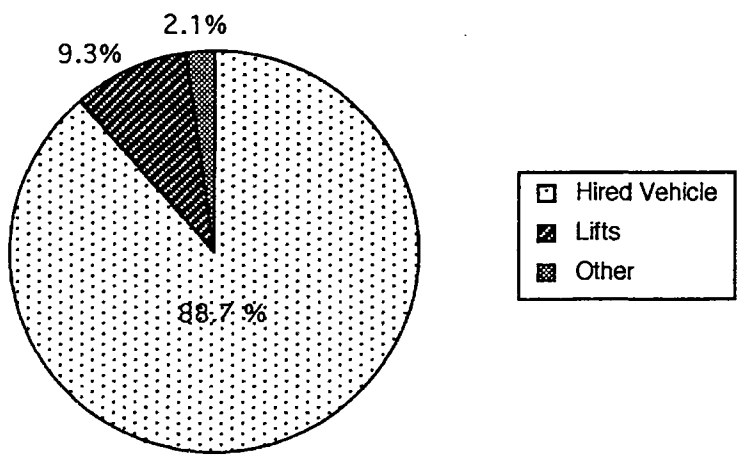
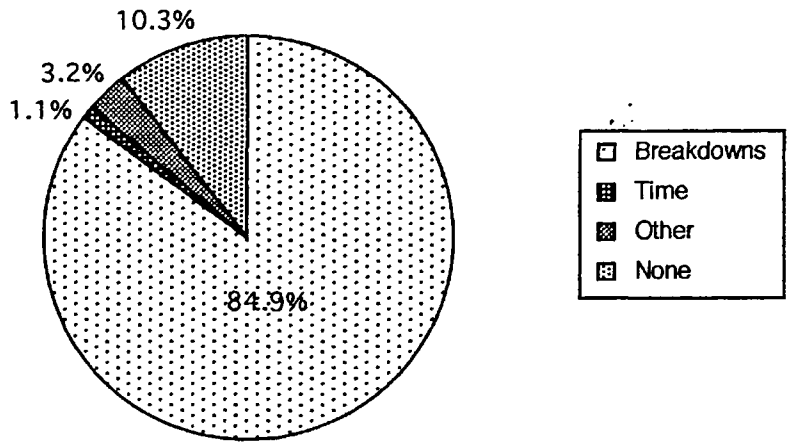


Figure 6.13 shows that breakdowns are considered the most important constraint faced in transporting, accounting for 84.9 per cent of the batches reported; 10.3 per cent gave no constraint or 'none' in response to this question; 3.2 per cent gave 'other' problems, such as finding and negotiating with sellers, as their most important constraint; and 1.1 per cent indicated that 'time' was their most important constraint. This indicates the importance of transport to traders' business, which should be borne in mind when it comes to recommendations to improve the distribution process for marketing fruit and vegetables in Dar es Salaam. According to the results of this survey of traders, if there are to be any improvements in the supply of food to the city, the roads connecting the main producing areas with Dar es Salaam must be improved in order to reduce breakdowns and ease the flow of traffic. It may be argued that this could have a beneficial effect on the prices offered to producers, because the easier access is to the producing areas, the easier it is for competing buyers to get access to the producers.

Figure 6.13 Constraints on Trading Activities Reported By The Traders



The traders were asked to specify what alternative transport methods were available to them. Eighteen out of the thirty traders interviewed (60 per cent) said that there were no alternatives. Only eight (26.7 per cent) gave the bus as an alternative. Two traders (6.7 per cent) would consider obtaining lifts from passing traffic, and only one each would consider using their own vehicle or a hired vehicle. This suggests that if their normal transport arrangements are unavailable, the majority of traders would not consider an alternative and would simply not trade. This indicates the importance of an adequate transport system to the distribution and marketing of fruit and vegetables in Tanzania. In most cases when traders are carrying large loads, the only viable transport method is a hired lorry. By comparison, the bus is an expensive method of transport, with restricted space, making it difficult to justify economically sending such a load to the urban market. When asked about the use of buses, some traders felt that they were not only expensive, but also not dependable, or the delays made the use of this method of transportation unnecessarily difficult. The buses make scheduled stops, which are often arranged with local business people in order to give them the opportunity to sell food, snacks and drinks to the passengers. This causes delays which traders with hired lorries can avoid. In addition, lorry drivers can use a greater amount of speed over the poor roads without the fear of complaints from the cargo. The traders hiring lorries benefit from being the main customer, whereas traders travelling by bus, as subsidiary customers, are forced to fit in with the priorities of the bus owners. Transport was considered the most significant cost of trading by 24 respondents (80 per cent). Other important costs include tariffs such as those charged by marketing authorities, such as Kariakoo Market Corporation, accounting for 10 per cent and the buying of crops 3.3 per cent.

Figure 6.14 Location of the Traders' Sale of Produce

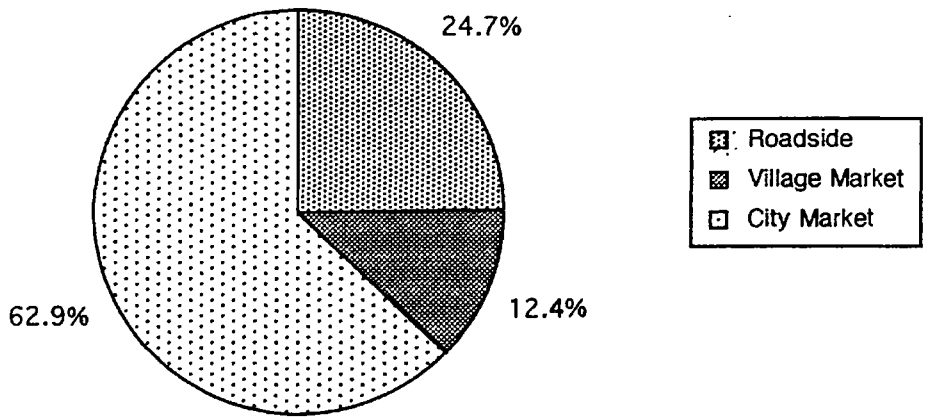
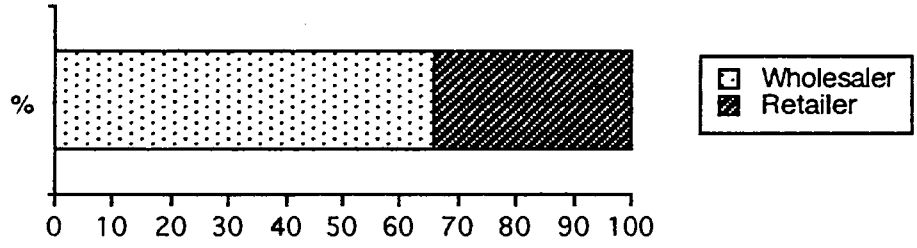


Figure 6.14 shows the location where the traders eventually sell their load. Some 62.9 per cent of the reported batches were sold in a city market, and 12.4 per cent were sold in a village, which equates with the 12 per cent already reported to be transported to Lushoto town (Figure 6.4). Finally, 24.7 per cent of the batches were sold by the roadside. If the village market element is eliminated and the rest (87.6 per cent) is assumed to take place in the urban areas, then 71.8 per cent of urban selling reported by these traders takes place in a city market and 28.2 per cent took place by the roadside. Because fruit and vegetables must legally enter the Dar es Salaam market through the Kariakoo wholesale market, the 28.2 per cent sold at the roadside are sold into the informal market. However, a proportion of the 71.8 per cent must also enter the Dar es Salaam market through informal wholesaling in the retail markets around the city, as described in earlier chapters. This is an indication of the proportion of traders from Lushoto involved in wholesale dealing on an informal or formal basis in the urban context. Most of the traders, farmers and other informants indicated that Kariakoo was the only market they would go to in Dar es Salaam, because it had all the required facilities and a healthy demand. It can be safely assumed, therefore, that a high proportion of the 71.8 per cent of the batches reported to be sold in city markets are in fact sold in Kariakoo. This can be reinforced in Figure 6.15 which shows to whom the batches of commodities were sold: 66 per cent were sold to wholesalers and 34 per cent were sold to retailers. Selling direct to retailers in Dar es Salaam is technically illegal and would not have taken place in Kariakoo. A number of wholesalers are known to operate outside Kariakoo in the main urban retail markets, and so a proportion of the 66 per cent may have been sold to them. As a result of the analysis of the Kariakoo wholesale market data in the previous chapter, it is clear that Kariakoo is beginning to favour vegetables over fruit, and the survey of Lushoto traders indicate that Lushoto District producers tend to specialise in commercial production of vegetables as opposed to fruit. This would suggest that there would be a heavy bias towards selling in Kariakoo among the Lushoto traders. Therefore, although it is known that a minimum of 34 per cent of the Lushoto traders sell on the informal market in Dar es Salaam, it can also be assumed that this is a relatively low estimate if

compared to a more mixed fruit and vegetable supplying area, and particularly if compared to a mainly fruit producing area, such as Korogwe in Tanga Region or Matombo in Morogoro Region which is likely to favour the informal market. However, based on these data, the figures generally suggest about 50 per cent of the cash market for fruit and vegetables in Dar es Salaam is formal and 50 per cent informal.

Figure 6.15 To Whom the Traders Sell



It is already clear from the discussion above, however, that the distribution within some variables is so dominated by one value as to make statistical testing difficult. The small sample size (n=30) makes extended use of the chi square test relatively difficult, particularly where there is a large bias towards one value in a variable. The contingency tables which follow present some of the data relating to the market location, the most important crop to the trader's business and the destination of the produce, as reported by the trader. Chi square tests have been carried out where possible. Where this is not possible the contingency tales will be discussed as they stand.

The cross-tabulation of market location by destination in presented in Table 6.11 shows that a higher than expected proportion of batches reported in Soni were destined for Tanga, while the batches reported in Lukozi were exclusively destined for Dar es Salaam. Batches of commodities purchased in Mlalo, on the other hand, were exclusively destined for Lushoto.

Table 6.11 Cross-tabulation of Destination of Commodities by Market Location

Count *Expected Value*	Dar es Salaam	Tanga	Lushoto	Row Total (Column %)
Soni	15 *25.9*	30 *14.4*	1 *5.8*	46 (47.9%)
Lukozi	39 *21.9*	0 *12.2*	0 *4.9*	39 (40.6%)
Mlalo	0 *6.2*	0 *3.4*	11 *1.4*	11 (11.5%)
Column Total Percent	54 56.3%	30 31.3%	12 12.5%	96 (100.0%)

In the case of those traders purchasing in Soni and Lukozi, however, the question arises that if Soni is favoured by traders transporting to Tanga, and if Lukozi is similarly favoured by traders transporting to Dar es Salaam, is there some form of produce specialisation? Table 6.12 shows that there is a significant chi square value relating the categories of the market location and the crop type, suggesting that there may be some degree of specialisation. When the table is examined, however, the most striking difference is that nine out of the eleven batches of goods reported in Mlalo are staples, while the other two, as the calculated expected variables would suggest, are fruits. In the case of Lukozi, the distribution follows the expected frequency relatively closely, never deviating by more than a residual of 1. Soni suggests some small degree of variance from the expected frequency favouring vegetables over staples, with fruit following the expected distribution. This suggests that the wholesale trading in Mlalo market tends to specialise more in trading staples, while Soni tends to specialise in more in vegetables.

Table 6.12 Cross-tabulation of Most important Crop Group by Market Location

Count *Expected Value*	Vegetables	Fruit	Staple/ Pulse	Row Total (Column %)
Soni	30 *24.7*	5 *5.8*	12 *16.5*	47 (48.5%)
Lukozi	21 *20.5*	5 *4.8*	13 *13.7*	39 (40.2%)
Mlalo	0 *5.8*	2 *1.4*	9 *3.9*	11 (11.3%)
Column Total Percent	51 52.6%	12 12.4%	34 35.1%	97 (100.0%)

Chi Square	15.46
Degrees of Freedom	4
Significance	0.0038

Table 6.13 has a highly significant chi square value, with the most striking feature of this table being the highly specialised purchases made for the Lushoto market; 10 out of 12 reported batches are of staples and the remaining two are of fruit. In the case of the purchases made for Tanga, they favour vegetables over staples, with an expected fruit element. This may reflect the preferences of the Tanga population for staples which cannot be competitively produced in Lushoto District. For example, maize is grown on the plains around Mombo, taking about three months to mature, while the same crop can take up to nine months to mature in the higher altitudes of the Usambara Mountains around Lushoto. Purchases for Dar es Salaam follow a more even distribution pattern of crop types. This reflects the large demand in the city for a wide variety of crops, combined with the local demand for staples, such as those which are traditionally grown in the valleys of the Usambaras (for example, yams). This also reflects the importance of growing a variety of pulses, such as pigeon peas, red kidney beans and cow peas, which can be grown either for subsistence or for sale.

It can be concluded, therefore, that the purchases made in the three villages reflect a specialised purchasing strategy for produce intended for the local market, featuring mainly staples or pulses and a small amount of fruit, which has a slightly different growing season, depending on altitude. The purchases for Tanga market do not appear to be specific in terms of crop type. They favour vegetables over staples or pulses, while fruit purchases correspond to the expected frequencies. Purchases for the Tanga market were reported exclusively in Soni. Purchases for the Dar es Salaam market include a more balanced spread of crop types, corresponding with the expected frequencies in Table 6.13, and reflecting its large and varied demand for all crops. Purchases were reported to favour Lukozi slightly over Soni, but none were reported in Mlalo at all.

Table 6.13 Cross-tabulation of Most Important Crop by Destination

Count *Expected Value*	Vegetables	Fruit	Staples/ Pulses	Row Total (Column %)
Dar es Salaam	30 *28.1*	6 *6.8*	18 *19.1*	54 (56.3%)
Tanga	20 *15.6*	4 *3.8*	6 *10.6*	30 (31.3%)
Lushoto	0 *6.3*	2 *1.5*	10 *4.3*	12 (12.5%)
Column Total Percent	50 52.1%	12 12.5%	34 35.4%	96 (100.0%)

Chi Square 17.725
Degrees of Freedom 4
Significance 0.0014

Table 6.14 cross-tabulates the person from whom the produce was sold by the destination of the produce. This yields a significant chi square value of 18.672. For both Tanga and Dar es Salaam, traders have tended to purchase directly from the producer, in 93 and 100 per cent of cases respectively, since this will keep purchasing costs relatively low. This may also be due to the volumes required in order to assemble an economically viable load. In order to achieve this, it may be necessary for buyers to go directly to producers in order to benefit from the economies of scale. In the case of the produce intended for Lushoto, there is a greater reliance than may be expected on other individuals: in 5 out of 12 cases (or 42 per cent).

Table 6.14 Cross-tabulation of Destination of Purchased Commodities by The People From Whom The Traders Purchased

Count *Expected Value*	Producer	Other	Row Total (Column %)
Soni	50 *48.9*	4 *5.1*	54 (56.3%)
Lukozi	30 *27.2*	0 *2.9*	30 (31.3%)
Mlalo	7 *10.9*	5 *1.1*	12 (12.5%)
Column Total Percent	87 90.6%	9 9.2%	96 (100.0%)

Chi Square 18.077
Degrees of Freedom 2
Significance 0.0001

The cross-tabulations in Table 6.15 and 6.16 deal with the location of produce purchase. In Table 6.15, this is cross-tabulated against the market location where the interview took place. In the case of Mlalo market, 10 out of 11 purchases reported were made in the market place. In Lukozi, the locations of purchases favoured the producer's farm, and produce originating from the trader's own farm are favoured over purchasing in the market place. The problems of interpreting this result have already been discussed, but this may be interpreted to mean that producers in Lukozi have their produce collected from their farm after having met the trader at the periodic market, since this is where the traders were interviewed at work. In the case of Soni, 33 out 47 (or 70 per cent) of the reported purchases took place in the market and the remaining 14 took place at the producer's farm. None of the reported batches of produce dealt with by traders at Soni originated from their own farm.

Table 6.15 Cross-tabulation of Where the Produce is Bought by the Market Location

Count *Expected Value*	Farm	Village Market	Own Premises	Row Total (Column %)
Soni	14 *17.4*	33 *25.2*	0 *4.4*	47 (48.5%)
Lukozi	21 *14.5*	9 *20.9*	9 *3.6*	39 (40.2%)
Mlalo	1 *4.1*	10 *5.9*	0 *1.0*	11 (11.3%)
Column Total Percent	36 37.1%	52 53.6%	9 9.3%	97 (100.0%)

Table 6.16, cross-tabulating the location of purchase with the destination market, follows a similar distribution to that of Table 6.15, if one equates Dar es Salaam with Lukozi, Tanga with Soni, and Mlalo with Lushoto. In this case a significant chi square value demonstrates a statistical relationship between the two variables. Dar es Salaam-destined produce tends to have been purchased at the producer's farm, produce bound for Tanga town tends to have been purchased in the village market, while the produce intended for Lushoto is almost exclusively purchased in the village market. Thus the evidence strengthens the suggestion of a link between the villages where the produce originates and the towns and cities, for which the produce is destined.

Table 6.16 Cross-tabulation of the location of the Purchases by the Destination Market

Count *Expected Value*	Farm	Village Market	Own Premises	Row Total (Column %)
Dar es Salaam	29 *20.3*	16 *28.7*	9 *5.1*	54 (56.3%)
Tanga	6 *11.3*	24 *15.9*	0 *2.8*	30 (31.3%)
Lushoto	1 *4.5*	11 *6.4*	0 *1.1*	12 (12.5%)
Column Total Percent	36 37.5%	51 53.1%	9 9.4%	96 (100.0%)

Chi Square	28.998
Degrees of Freedom	4
Significance	0.0000

Table 6.17 Cross-tabulation of The Reasons for Storing by the Market Destination

Count *Expected Value*	Transport	Marketing	Ripening	Row Total (Column %)
Dar es Salaam	15 *10.9*	18 *14.4*	1 *8.7*	34 (72.3%)
Tanga	0 *1.2*	0 *1.7*	4 *1.0*	4 (8.5%)
Lushoto	0 *2.9*	2 *3.8*	7 *2.3*	9 (19.1%)
Column Total Percent	15 31.9%	20 42.6%	12 25.5%	47 (100.0%)

Table 6.17 cross-tabulates the destination of the produce against the reasons the traders have given for storing the produce. The most striking observation is that relatively few of the traders store at all, and of those who do, most appear to be dominated by purchases made for the Dar es Salaam market. Surprisingly few of the batches purchased for Tanga use storage, while a remarkably high proportion of those purchased for the Lushoto market do. The producers selling produce in Lushoto are mainly concerned with less perishable staples and pulses and can, therefore, store the produce relatively easily, whereas the more perishable vegetables and fruits destined for the urban markets of Tanga and Dar es Salaam, must be transported almost immediately in order to avoid wastage due to over-ripening.

In the case of purchases made for both Tanga and Lushoto, the main reasons given for storing crops are what has been termed ripening reasons in Table 6.17, such as to prevent spoilage or to allow the crops to ripen. In the case of Dar es Salaam, on the other hand, 'other' reasons assume greater importance. Fifteen out of the thirty-four reported batches (44 per cent) were stored for reasons of transport; for example, to wait while obtaining transport, or to assemble an economically viable load. Eighteen out of the thirty-four batches (53 per cent) were stored for marketing reasons, such as to wait for the (periodic) market to take place or to wait for a good price. This latter result suggests a greater degree of commercial awareness among the traders purchasing commodities for the Dar es Salaam market.

Storage has become an important part of horticultural marketing in the developed world. In countries such as Tanzania, however, with a generally high humidity and temperature, the storage of perishable goods is more difficult, and, therefore, more expensive. Experiments in refrigerated transportation were made in the early 1980s, with the National Cold Chain Operators using refrigerated lorries and train cars, but sadly this has been a failure, with technical and managerial difficulties impeding the flow of fresh goods. While the majority of consumers of commodities such as fruit and vegetables have difficulty in purchasing them, according to the general manager of Kariakoo Market Corporation, the market will not sustain the added cost of storage refrigerated transportation. Jones (1987), however, argues that approaches to this problem have focussed on technology which is far too expensive, and that simpler cheaper storage methods could be found.

Table 6.18 Cross-tabulation of the Location of Sale by the Market Location

Count *Expected Value*	Roadside	Village Market	City Market	Row Total (Column %)
Soni	15 *11.6*	1 *5.8*	31 *29.6*	47 (48.5%)
Lukozi	9 *9.6*	0 *4.8*	30 *24.5*	39 (40.2%)
Mlalo	0 *2.7*	11 *1.4*	0 *6.9*	11 (11.3%)
Column Total Percent	24 24.7%	12 12.4%	61 62.9%	97 (100.0%)

Chi Square	89.0412
Degrees of Freedom	4
Significance	0.0000

Table 6.18 shows a cross-tabulation of the location of sale, as reported by the traders, against the location of the interviews, and, therefore, where the trader mainly negotiates or purchases the crops. All the purchases reported in Mlalo were sold in a village market, which is already known to be Lushoto; 30 out of 39 purchases (77 per cent) reported in Lukozi were sold in a city market, while the remaining 23 per cent were sold by the roadside. In the case of Soni, 31 out of 47 purchases (66 per cent) were sold in a city market, while 32 per cent were sold by the roadside and the remaining 2 per cent went to Lushoto.

Table 6.19 Cross-tabulation of the Location of Sale by the Destination Market

Count *Expected Value*	Roadside	Village Market	City Market	Row Total (Column %)
Dar es Salaam	9 *13.5*	0 *6.8*	45 *33.8*	54 (56.3%)
Tanga	15 *7.5*	0 *3.8*	15 *18.8*	30 (31.3%)
Lushoto	0 *3.0*	12 *1.5*	0 *7.5*	12 (12.5%)
Column Total Percent	24 25.0%	12 12.5%	60 62.5%	96 (100.0%)

Table 6.19 may help in the interpretation of the previous results. There are too many observed frequencies of zero to carry out a chi square test on this table, however, a pattern emerges. All the purchases destined for Lushoto were sold in a village market. Half of the purchases made for Tanga were sold in a city market and half were sold by the roadside, suggesting a higher degree of informal trading in Tanga. It may also be that some traders sell commodities in Tanga themselves, since it is only a six-hour bus journey from Lushoto, and it is also relatively easy to obtain transport. Dar es Salaam has forty-five out of fifty-four, or 83 per cent, of the reported batches being sold in a city market and 17 per cent sold by the roadside. The 17 per cent is clearly informal trading. However, a proportion of the 83 per cent of batches being sold in Dar es Salaam's markets are also informal, since it is estimated by the Kariakoo Market Corporation that about 60 per cent of the produce entering the Dar es Salaam market is traded informally.

Table 6.20 Cross-tabulation of The Persons to Whom the Traders Normally Sell by the Market Location

Count *Expected Value*	Wholesaler	Retailer	Row Total (Column %)
Soni	41 *35.4*	13 *18.6*	54 (56.3%)
Lukozi	19 *19.7*	11 *10.3*	30 (31.3%)
Mlalo	3 *7.9*	9 *4.1*	12 (12.5%)
Column Total Percent	63 65.6%	33 34.4%	96 (100.0%)

Chi Square	11.389
Degrees of Freedom	2
Significance	0.0034

Table 6.20 is a cross-tabulation of the destination of the purchases reported by the traders with the people to whom they sold the produce. A chi square test proves a significatn statistical relationship between the two variables. Of the produce sold in Dar es Salaam, 13 out of 54, (24 per cent), of the reported batches of produce were sold directly to a retailer, while the remaining 76 per cent was sold to wholesalers. In Tanga, the distribution was as expected with about 63 per cent of the reported produce being sold to wholesalers and the remaining 37 per cent being sold directly to retailers. Again this gives an indication of the level of informal sector trading of fruit and vegetables in Dar es Salaam and Tanga. However, as there are wholesalers in these cities operating in the informal sector it can be assumed that a proportion of the 76 per cent in the case of Dar es Salaam and 63 per cent in the case of Tanga, which is sold to wholesalers, remains within the informal sector.

6.3 Conclusion

It can be concluded that the wholesale trading of fruit and vegetables in Lushoto is highly flexible and adaptable. It is conducted on a modest scale by a large proportion of the population, many of whom have reasons to travel hence trading is a means of defraying travelling costs of a journey, and may even add something to the participant's income.

Large-scale fruit and vegetable traders tend to find their suppliers at the district's periodic markets, although the purchase, that is the transfer of cash for goods, does not necessarily take place at the market, but may take place later in the day when the trader brings a hired lorry to the producer's field to collect the produce. Wholesale trading of fruit and vegetables is predominantly a cash-based system, with credit, when it does exist, only usually being given in transactions between relatives, or at least people who are well known to each other. It is, however, possible for the traders to hire transport using credit.

Each of the markets surveyed appeared to concentrate on supplying only one destination. In the case of the survey markets, Mlalo supplied Lushoto with mainly staples and a little fruit;

Lukozi supplied Dar es Salaam with mainly vegetables, but also some staples or pulses and some fruit; and Soni supplied Tanga with a relatively even distribution of each of the commodity groups.

In spite of the evidence presented in the more informal interviews with farmers, market officials and local government or extension officers, the survey revealed that about 24 per cent of the supply bought in the survey markets for Dar es Salaam is sold direct to a retailer there. In other words, this constitutes a minimum proportion of produce which enters the Dar es Salaam market through the informal sector. This proportion is higher for Tanga resulting in the bar graph in Figure 6.15. However, this estimate of the proportion of informal sector fruit and vegetable trading can be increased, because of the known informal wholesaling activities in Dar es Salaam's markets other than Kariakoo.

Chapter Seven

Fruit and Vegetable Market Prices in Dar es Salaam and its Main Supply Areas

7.1 Annual Market Price Margins

This chapter uses retail market prices to analyse the changes in fruit and vegetable prices across time and space. The data are collected by market reporters employed by the Marketing Development Bureau, a department in the Tanzanian Ministry of Agriculture. These data are then used to calculate margins between the price in the towns in production areas and the price in Dar es Salaam. The real prices are then calculated using the retail price index.

This section will examine the margin between the deflated average annual market price recorded in Dar es Salaam and the corresponding price in the supply town markets. It should be noted that this is only a guide to serve as an indicator for the trend in the market prices of these commodities, and not the actual market margins obtained by the traders or middle agents involved in the dealing of fruit and vegetables.

The bar charts demonstrate a general tendency for market margins to remain approximately constant, or to show a decline over the course of the time series (from 1983 to 1989). This consistency is particularly apparent for cabbages. The margins for Irish potatoes, oranges and tomatoes have shown a tendency to decline up to the mid-1980s, and then begin a modest increase towards the end of the decade. In any event, in the early part of the 1980s, coconut, onions and sweet bananas were the only commodities, of those selected, to show an overall increase in real price margins. In the case of coconuts, however, there is evidence of that increase tailing off towards the end of the series in 1989. The trend of the market margin appears to be more a function of the type of commodity and less a function of the origin of the produce. For example, if coconuts, onions and sweet bananas were excluded, this would leave only three instances of a positive net change in market margin, these being in the case of tomatoes in Moshi and Morogoro and cabbages in Moshi. Although tomatoes are produced in Moshi, the distance and condition of the road have been negative and disruptive factors in the trade between Dar es Salaam and Moshi. However, if the positive trend continues and the plans to improve large sections of this important road go ahead, this evidence suggests that the market margin is likely to be exploited as tomatoes and cabbages, in particular, begin to be supplied to the Dar es Salaam market from Moshi.

The clear advantage of such improvements is an increased supply to Dar es Salaam of these foods, which are important supplements to the urban diet. In addition, Kilimanjaro Region

produces cabbages mainly in the last four and first two months of the year (Marketing Development Bureau, 1986), when cabbage prices are relatively high in Dar es Salaam. An increased supply from Moshi, at this time in particular, will help to lower prices to consumers at a period, when previously they have been high, and improve supply when previously it has been low.

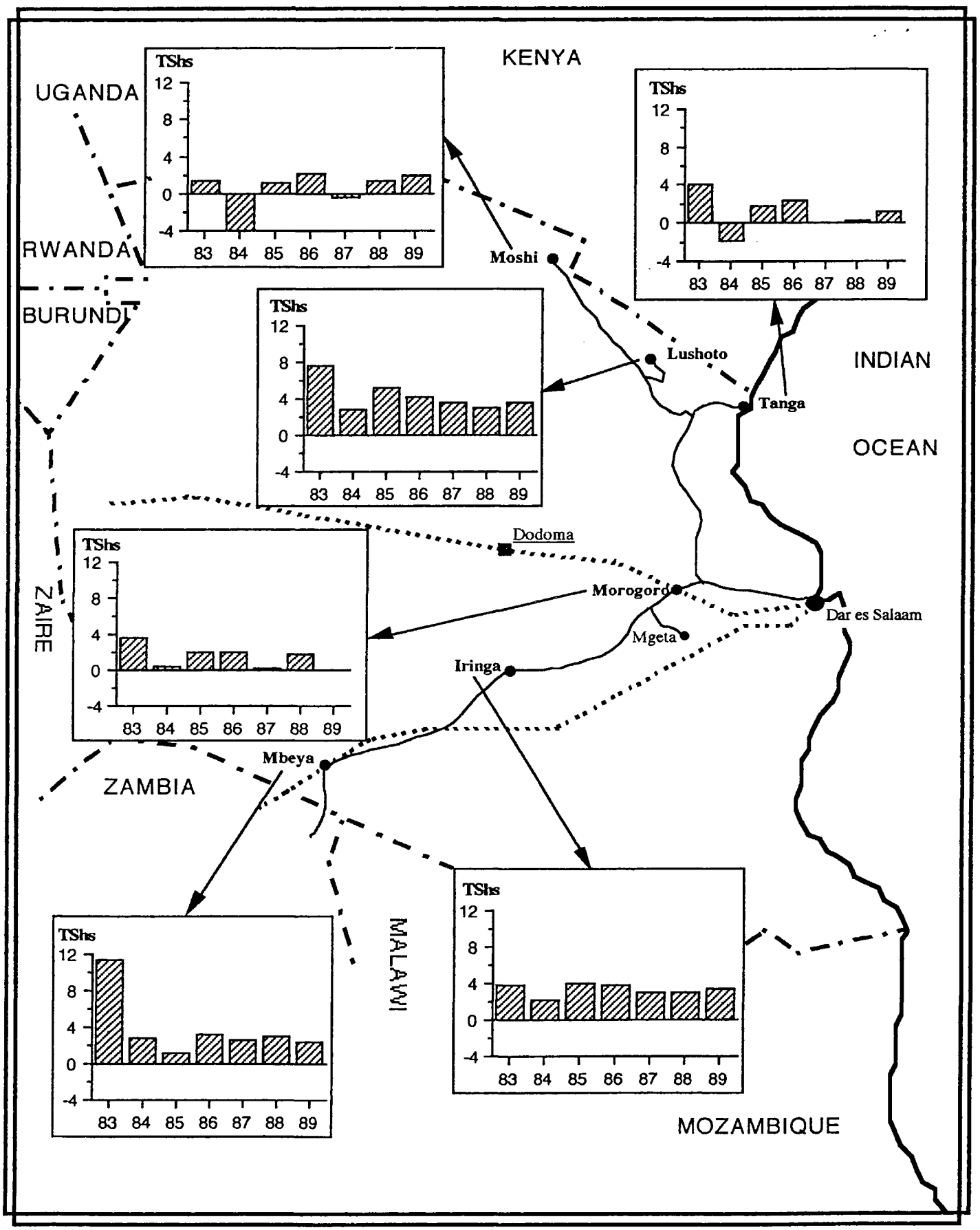
Cabbages (Figure 7.1)

The general pattern to be found in the cabbage mean annual margins is for a decline over the course of the time series. However, Moshi and Iringa, after an isolated decline in 1984 and a slight decline in 1987/88, have margins which are relatively stable or increasing. In the case of Moshi, the margin never reaches more than TShs 2.00 per kilogram, while in the case of Iringa, one of Dar es Salaam's main supply areas, the margin varies between TShs 2.00 and a maximum of TShs 4.20. The isolated decline to be found in 1984 is not peculiar to Moshi and Iringa, but is evident in all the towns. The reason for this fall in margin is not clear, but it appears to be largely a function of a drop in the real mean annual price of cabbages reported in Dar es Salaam. Mbeya records the highest mean annual price margin of the series in 1983 at TShs 11.32, although in the years following this, Mbeya only twice achieves a mean annual real margin of more than TShs 3.00. Lushoto, reportedly the main producer of cabbages for the Dar es Salaam market, has a real price margin that declines over the course of the series. Lushoto's strength, in terms of its real margin performance, is that the minimum of TShs 2.84 in 1984 is the highest minimum of the six towns reported.

Morogoro Region is also reported as an important supplier of cabbages to the Dar es Salaam market. Nevertheless, the margins achieved are relatively low, rarely higher than TShs 3.50 per kilogram. Two explanations may be put forward. Firstly, Morogoro has a major locational advantage over the other supply areas, in that the distance to Dar es Salaam is less (see Figure 7.1) and, in addition, the condition of the road, from Morogoro town at least, is relatively good. For example, in Mgeta Division in Morogoro Region, the main cabbage producing area in Morogoro, the author observed a lorry making approximately five trips to Dar es Salaam in forty-eight hours. This would not be possible from Iringa or Lushoto, where lorries supplying to Dar es Salaam generally set off to drive overnight, timing their journey to arrive at Kariakoo at about 5 am, when the wholesale market opens and prices are generally good. The lorry may then be able to return to its starting point that evening, in other words one round trip in 24 hours. This, in addition to the assembly of larger loads, results in comparatively cheaper transport costs for traders supplying Dar es Salaam with Morogoro cabbages and enables the traders to make more from a smaller margin.

A second explanation for this difference is the location of the markets where the prices were recorded. Lushoto town is located in the heart of Lushoto District, a little closer to the main road than most of the highland area which makes up the vegetable producing district.

Figure 7.1 The Price Margins for Deflated Cabbage Prices in Dar es Salaam and the Main Supply Areas (TShs per kilogram)



Morogoro, on the other hand, is located almost half way from Mgeta, to Dar es Salaam, in terms of travel time by lorry. In addition to this, Morogoro is a relatively well-developed town located on a dry plain, with a high demand for food commodities, particularly from the more temperate highland areas, such as Mgeta. These two conditions, the high demand and the more distant location from the producing areas will tend to lower the margin recorded in Morogoro town, making it problematic to compare this with Lushoto directly.

Coconut (Figure 7.2)

The mean real market price margins for coconuts for the selected towns can be divided into two main patterns, those declining over the time series, and those increasing. These two groups characterise, on the one hand, coconut producing areas, and, on the other hand, those which do not produce coconuts.

Tanga's margin increases initially, before declining towards the end of the period. The period begins in 1983 in Tanga with a margin of TShs 0.54 per nut and rises to a margin of TShs 1.50 in 1986. This is followed by a decline to TShs 0.82, resulting in a small net decline over the time period. In the other markets, which are not in coconut-producing areas, there has been a rise in the margin over the time series. This is most evident in the case of Mbeya, where the margin began the series at minus TShs 5.24, rising to minus TShs 1.61, before data are no longer available in the following years. The trend is also apparent in Iringa, rising from minus TShs 4.96 to minus TShs 1.84. The Moshi price margin rises by TShs 1.74 net to TShs 0.22 in 1986, before falling again to minus TShs 0.53 by 1989. Lushoto rises from minus TShs 1.07 to within TShs 0.35 of the zero margin, with the significant exception of 1986, when the price margin falls to minus TShs 2.82. Finally, Morogoro, which has a margin that records a price higher than Dar es Salaam only in 1987, produces a margin which increases from minus TShs 0.25 in 1983 to TShs 0.85 in 1986, the following years however decline to within TShs 0.25 of either side of the zero margin line.

According to the Kariakoo group interview, the main producers of coconuts for the Dar es Salaam market are Mafia Island and Kisiju, on the Pwani coast. Only Mafia is covered by the MDB's Market Information Service, but because it only produces coconuts for the Dar es Salaam market it has been omitted from this analysis. Closer examination of the pricing patterns in both Mafia and Kisiju would help to explain the declining differential prices recorded in the net supply area of Tanga, because these would allow a fuller examination of the price margin patterns there.

Irish Potatoes (Figure 7.3)

The mean annual market price margins for Irish potatoes decline over the time series in each of the towns covered in this analysis. The highest net decline over the time period occurred in Mbeya, declining from TShs 9.28 per kilogram to TShs 2.48.

Figure 7.2 The Market Margins for Deflated Annual Coconut Prices in Dar es Salaam and the Main Supply Area Market Towns (TShs per nut).

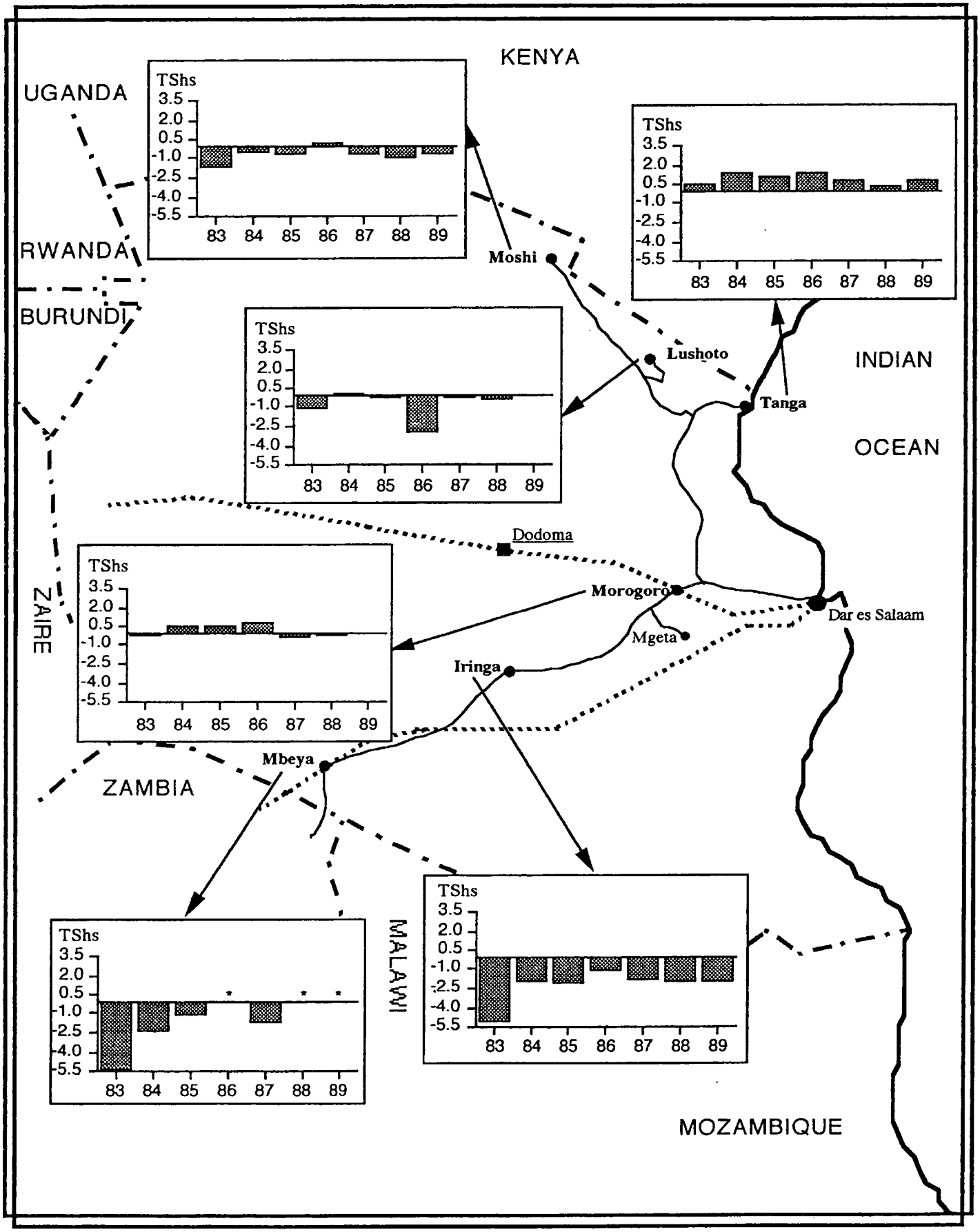
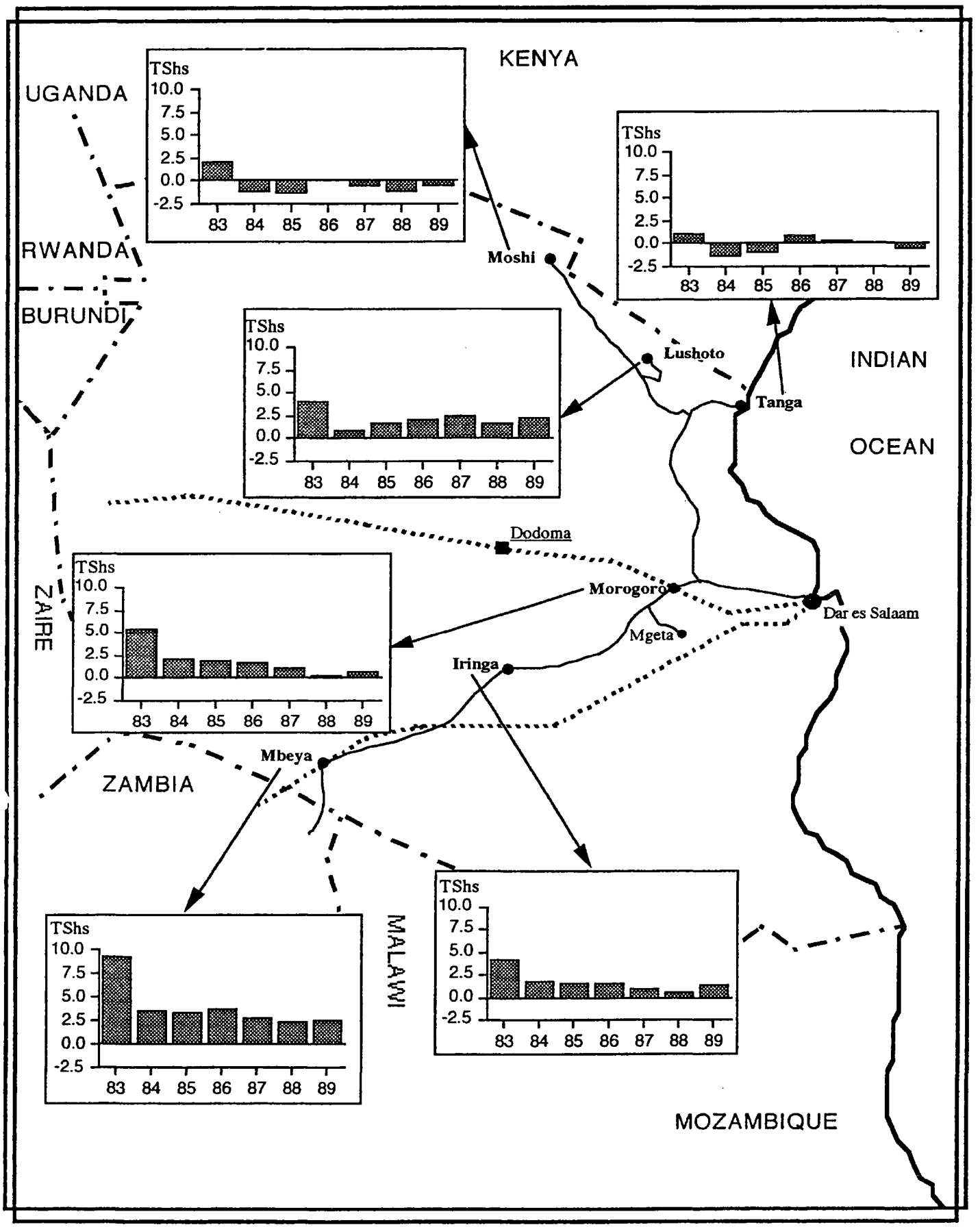


Figure 7.3 The Market Margins for Deflated Annual Irish Potato Prices in Dar es Salaam and the Main Supply Area Market Towns (TShs per kilogram).



The towns from the northern part of the country, namely Moshi, Lushoto and Tanga, also had an initial decline in margins in 1984/85, before rising through the rest of the time series. None of these three, however, were able to return to the level of margin which they had recorded at the beginning of the period. For example, Lushoto, one of the main supply areas for Dar es Salaam, begins with a mean annual real market price margin of TShs 3.92 per kilogram in 1983, followed, in 1984, by a margin of TShs 0.75. In the latter part of this series Lushoto's margin climbs up to TShs 2.09 in 1989.

Although Moshi and Tanga follow the initial pattern exemplified by Lushoto, with variations of about the same magnitude, their mean annual margins are at a lower level, Moshi beginning the period at TShs 2.63 and ending with a margin of minus TShs 0.60, while Tanga begins the period with a margin of TShs 0.99 and ends at minus TShs 0.52. This similarity may be in part due to the fact that Lushoto and Moshi are very important suppliers of Irish potatoes and Tanga is relatively easily supplied by these areas through a good road connection, although this road has deteriorated in the latter years of this series. The occurrence of a negative margin indicates a period when the price of the commodity in the market town is higher than that in Dar es Salaam. The likely reason for this is that the production of the commodity near to the market town has ceased, while Dar es Salaam is receiving supplies from elsewhere. Under these circumstances it is unlikely that Moshi or Tanga supplies Dar es Salaam with potatoes, they are more likely to come from Lushoto or Mbeya, both of which have high positive margins at the end of the period.

Morogoro, Mbeya and Iringa, all of which are located in the southern and central part of Tanzania, begin this time series with a relatively high mean annual margin. In the case of Mbeya, considered by the MDB's 1986 report to be a very important national net supplier of Irish potatoes, the first year recorded the highest mean annual real market price margin of all the series, at TShs 9.28 per kilogram. From 1984 until the end of the period the margin in Mbeya declined from about TShs 3.50 to TShs 2.50, 1988 recording the lowest margin of TShs 2.36. Morogoro and Iringa started the period with a peak margin of TShs 5.31 and TShs 4.32 respectively. Their margins thereafter declined from about TShs 2.00 to TShs 0.50, with a low of TShs 0.25 in 1987 in the case of Morogoro, and from TShs 1.75 to TShs 0.70, with a modest rise of TShs 1.39 in 1989 in the case of Iringa.

The MDB's 1986 report argues that Mbeya and Kilimanjaro regions are the two key supply areas for the country and that they will determine the price trends in the other regions. If this is the case, it may be suggested that the two patterns of price trends described above are influenced by the trends of Mbeya town, as they are presented here, and Kilimanjaro region as they are represented by the price data of Moshi town. In the light of this, it is surprising that the group interview of Kariakoo market tally clerks should omit Mbeya from a list of regions from which Irish potatoes are supplied to Kariakoo. This may be explained by the fact that potatoes from Mbeya are not arriving at Kariakoo, but going elsewhere.

Onions (Figure 7.4)

Onions are one of the few commodities, covered by this analysis, to demonstrate an upward trend in all its represented supply towns. Singida Region is considered by both the MDB 1986 report and the Kariakoo staff as the main producer of onions for both Dar es Salaam and the country as a whole. However, as onions are the only horticultural commodity Singida supplies to Dar es Salaam, it has been omitted from this analysis. Arusha is also considered, by both the MDB and the Kariakoo staff interviewed, to be of importance, but, because of its limited supply of other commodities to Dar es Salaam, it is also not included here. However, Iringa, Moshi, Morogoro and Mbeya were all mentioned in the Kariakoo group interview as areas of importance in the supply of onions to Dar es Salaam. The highest mean annual margin recorded in all the towns occurs in Mbeya, at TShs 8.53 per kilogram, where the lowest margin is also recorded, at minus TShs 15.79 in other words TShs 15.79 higher than the Dar es Salaam price.

The evidence of the barcharts suggests that 1983 was a bad year for the onion market price margins for most towns supplying Dar es Salaam. Apart from Morogoro, which does not appear to have been as adversely affected, the margins for this year range from minus TShs 3.47 in Moshi to minus TShs 15.79 in Mbeya. All the towns increased their margins during the rest of the series, except Morogoro, where the margin declines in the mid 1980s to within TShs 0.13 of the Dar es Salaam price, before climbing to a mean annual real market price margin of TShs 4.06. Iringa was the only town where the onion market price failed to drop below the Dar es Salaam, resulting in a constantly negative market margin throughout the period, the nearest was a margin of minus TShs 0.72 in 1984.

Oranges (Figure 7.5)

Each of the locations covered in this analysis demonstrate a net decline in the mean annual real price margins for oranges. Surprisingly, the highest margin recorded in any of the towns was recorded by Lushoto at TShs 0.74, which is not in an area of major orange production, but which undoubtedly benefits from the relative proximity of the orange growing area around the town of Korogwe (See Figure 4.26). Tanga town, although it is the capital of Tanzania's principal orange producing regions, is also a centre of relatively high demand. This will have the effect of reducing the margin between the price obtained in Tanga and that in Dar es Salaam. By the end of the time series, Tanga has the highest margin of TShs 0.25 per fruit. It is surprising to note that there is little to distinguish the other orange growing areas, represented here, such as Morogoro and Tanga, which are both considered as important orange supply areas. Morogoro and Tanga have price margin variation patterns which are as similar to other net consuming areas, represented here by towns such as Moshi, Lushoto and Mbeya, as they are to each other. In fact, in 1984 Morogoro records a margin suggesting that the mean annual real market price of an orange was TShs 0.17 per fruit higher than in Dar es Salaam, in spite of the significant orange growing areas located near to the town.

Figure 7.4 The Market Margins for Deflated Annual Onion Prices in Dar es Salaam and the Main Supply Area Market Towns (Tshs per kilogram).

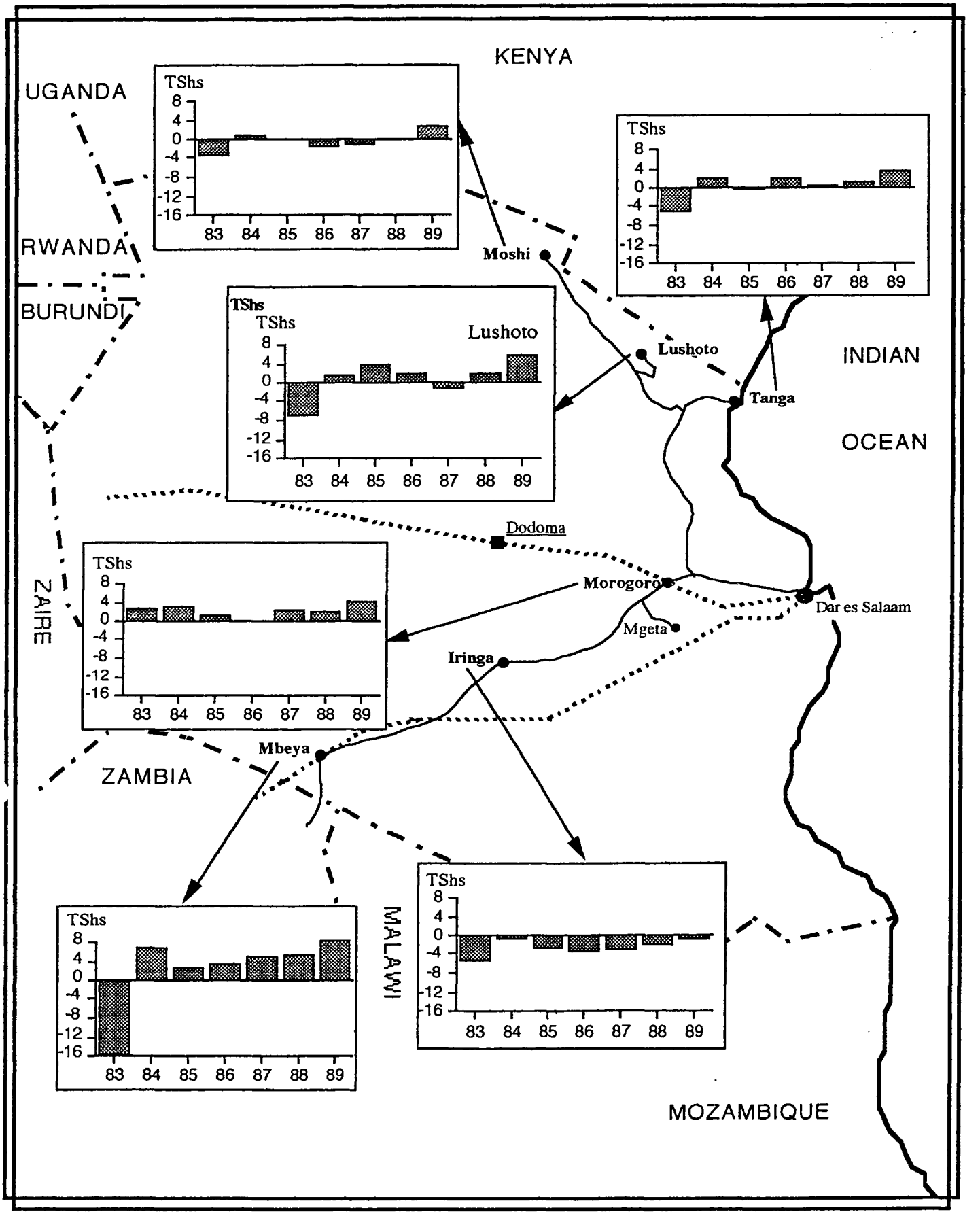
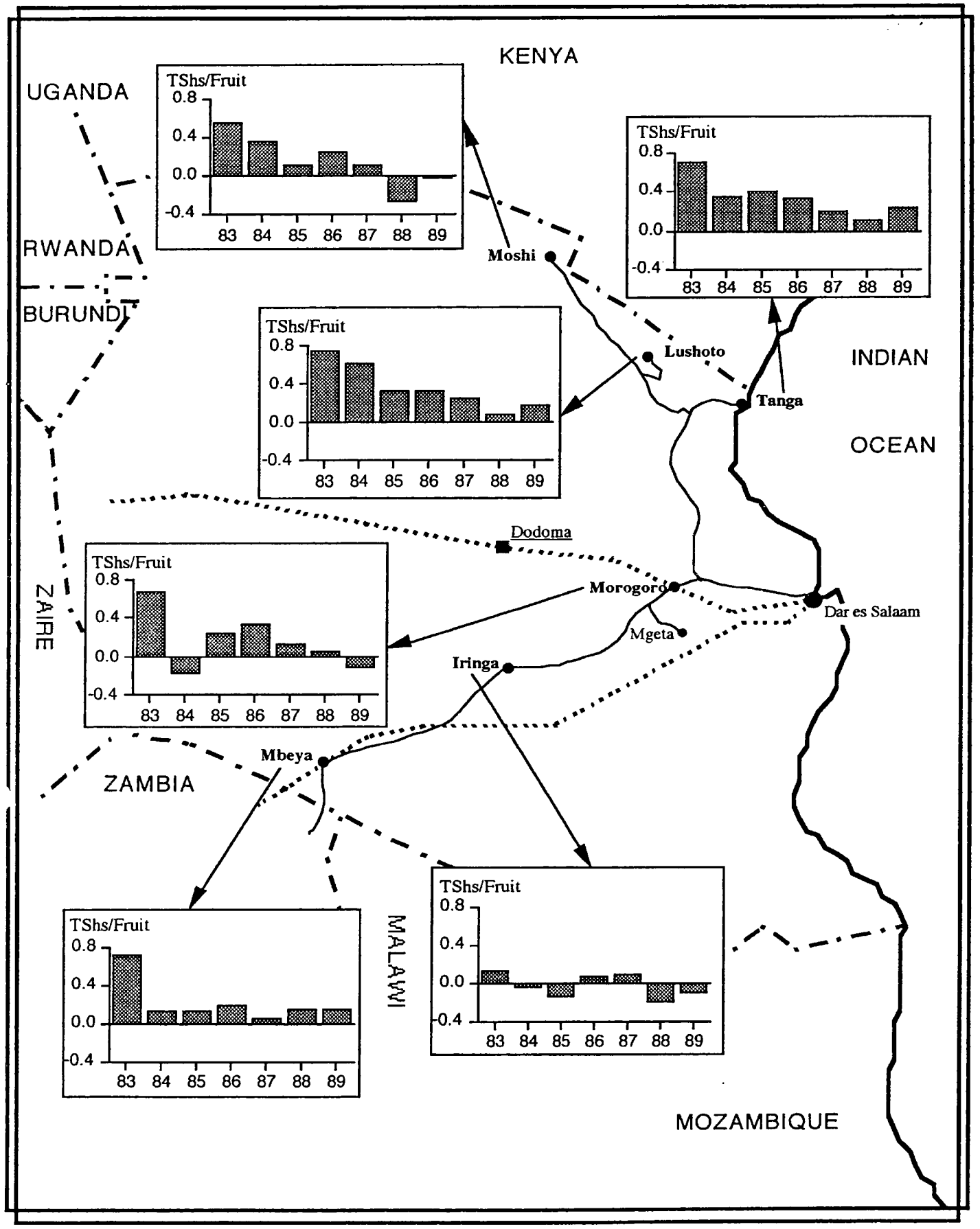


Figure 7.5 The Market Margins for Deflated Annual Orange Prices in Dar es Salaam and the Main Supply Area Market Towns (TShs per fruit)



This situation may in part be explained by the fact that the actual growing areas in both Morogoro and Tanga region are some distance from the town markets, thus incurring the added costs of transportation and marketing, though not as high as in the case of produce marketed in Dar es Salaam. This will have the effect of bringing the market prices in Morogoro and Tanga closer to those of Dar es Salaam. This effect may be further compounded by the fact that the main orange growing areas in Tanga Region are located on the main road from Tanga town to Dar es Salaam, and consequently it is not necessary for the oranges to pass through Tanga town itself. Finally Morogoro and Tanga, as significant urban centres themselves, represent areas of high demand for all food crops. This has tended to inflate the price of commodities relative to rural areas.

Tomatoes (Figure 7.6)

There is no discernible general trend in the mean real price margins recorded for tomatoes. This may be a function of the fact that tomatoes are grown in most regions of Tanzania, and therefore each market's margin trend will be largely a function of its own local supply rather than of the supply to Dar es Salaam. Because of their very high perishability, it is more practical to produce tomatoes relatively close to the consumption area, unless very good growing conditions exist for popular varieties at some distance from the an area of high consumption, as in the case of Lushoto and parts of Morogoro.

Sweet Bananas (Figure 7.7)

There is a general trend in all the sweet banana mean market price margins of positive growth, although in the case of Moshi and Lushoto, this begins in 1985 after an initial decline. In Lushoto it is TShs 0.25 per fruit, while in Moshi it is TShs 0.04. In each case these are followed by a decline in 1985. The remainder of the 1980s is spent climbing back to the 1984 level. In the case of Moshi, this is achieved and improved on, ending the period with a margin of TShs 0.18.

Mbeya, ranked second as supplier of sweet bananas to Kariakoo market by the Kariakoo group interview, records the highest mean market price margin in 1989 with TShs 0.44, having increased from TShs 0.18 in 1984. Morogoro, ranked as the most important supplier, records mean annual prices, which are higher than those in Dar es Salaam, in the first four years of the time series. It barely achieves a positive margin by the end of the series reaching TShs 0.02 in 1988 and TShs 0.03 in 1989.

7.2 Monthly Market Margins

This section will examine the seasonal variation in actual market prices for the selected commodities by looking closely at their monthly mean price variations. Once again the market

Figure 7.6 The Market Margins for Deflated Annual Tomato Prices in Dar es Salaam and the the Main Supply Area Market Towns (TShs per kilogram).

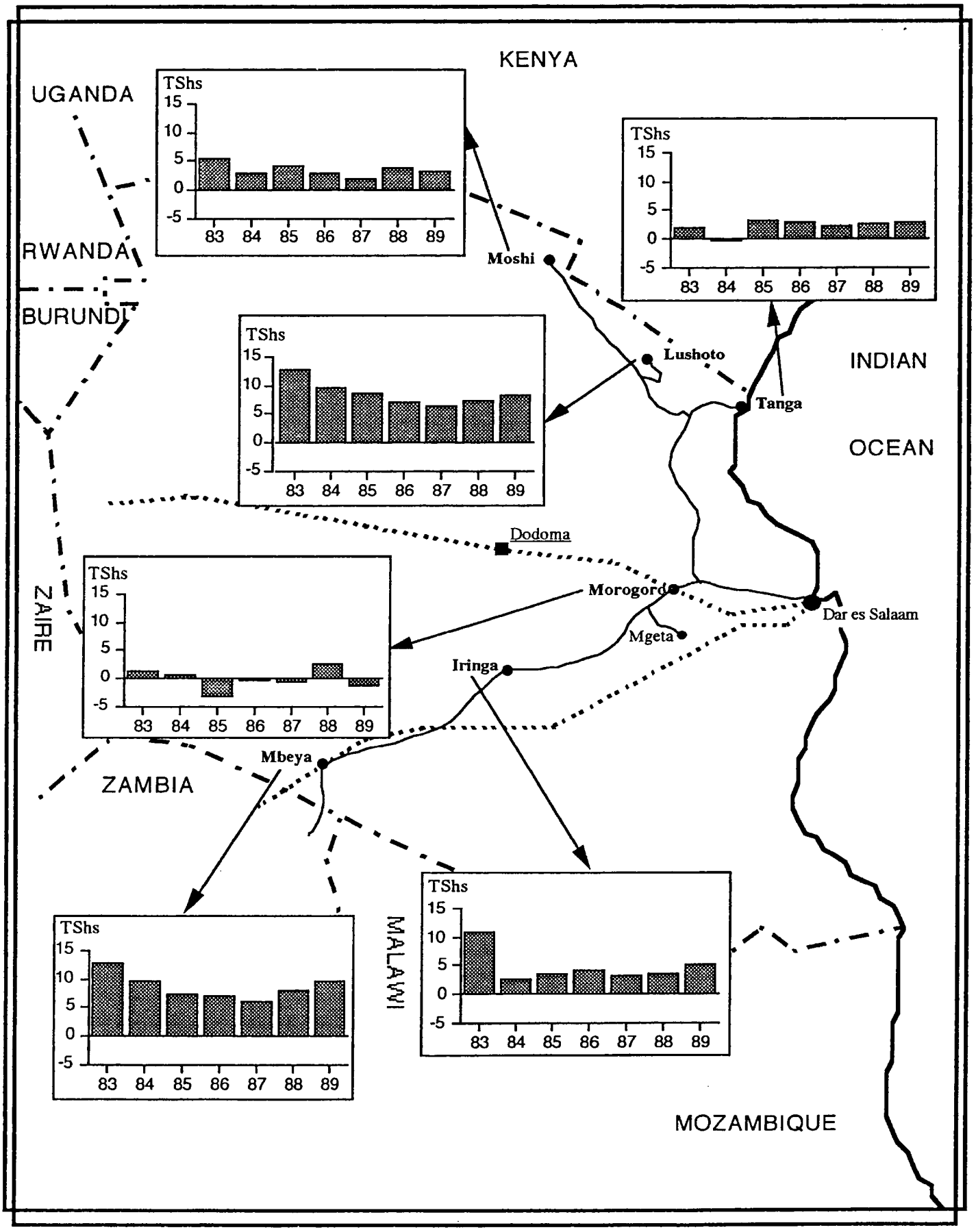
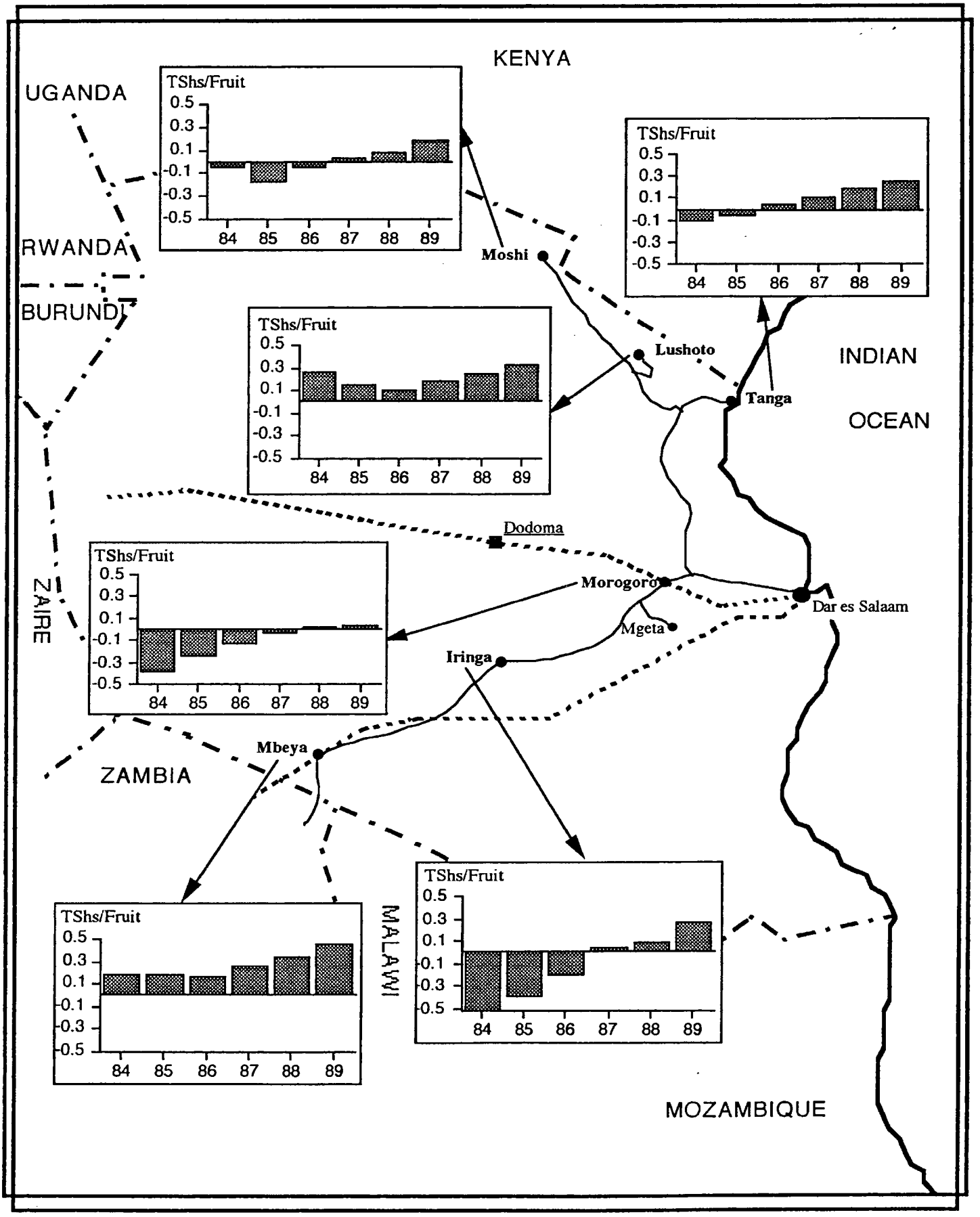


Figure 7.7 The Market Margins for Deflated Annual Sweet Banana Prices in Dar es Salaam and the Main Supply Area Market Towns (TShs per fruit).



price margins, representing the difference between the market price in Dar es Salaam and the supply town markets, is calculated. This will be compared to give an indication of the price differential between the main supply areas and the main net consuming area. This method of analysis will also highlight months when some areas are able to profit most from supplying the Dar es Salaam market.

Cabbages (Figure 7.8)

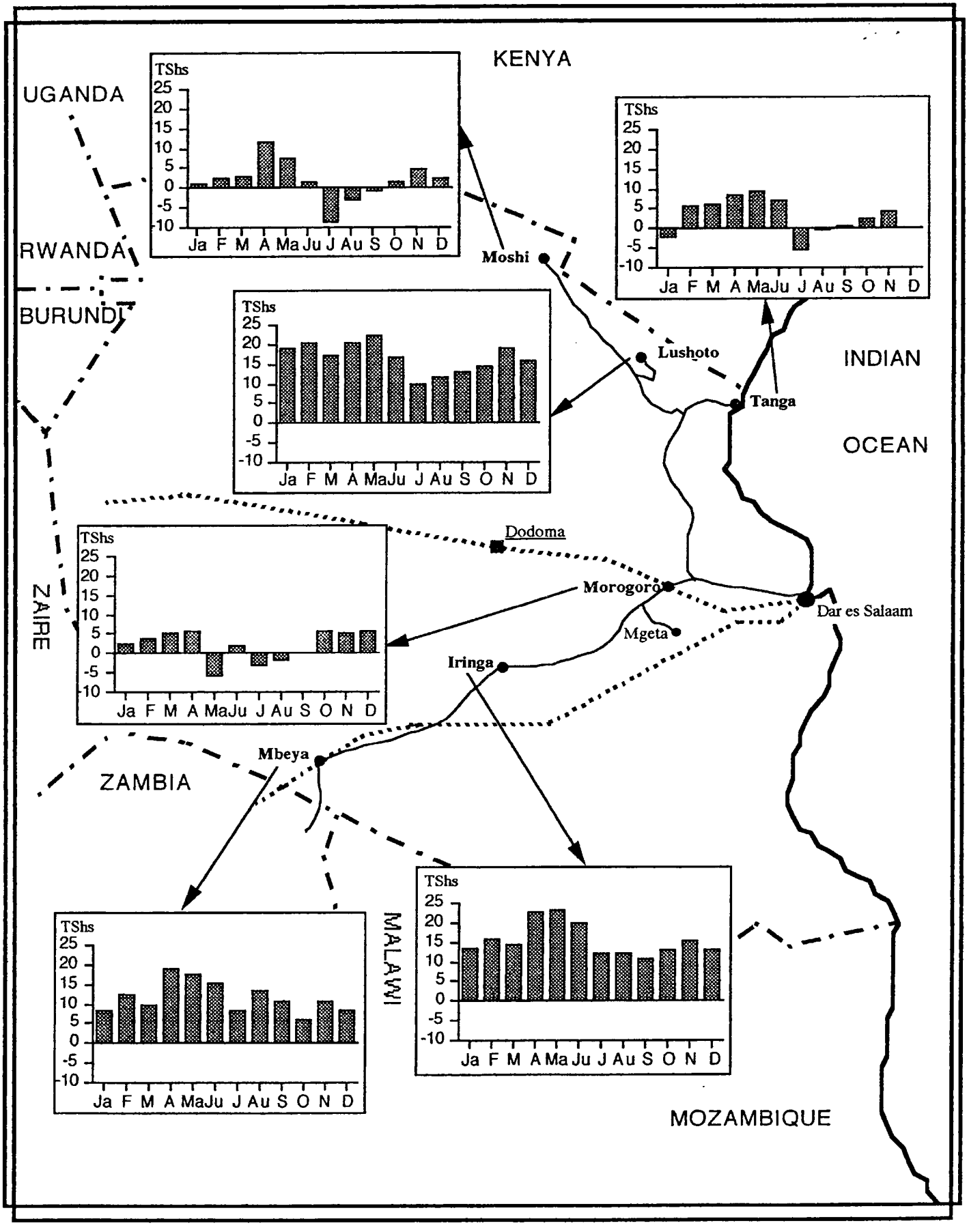
The mean monthly market margins in Tanga, Moshi and Morogoro produce an undulating pattern, building up to about TShs 10 per kilogram in April, falling to between minus TShs 5 and minus TShs 9 in July, or May in the case of Morogoro, and returning to a positive margin, by October, of about TShs 5. In Tanga, Moshi and Lushoto, July is the month with the lowest margins, while the highest margins for these towns, located in northern Tanzania, occur in May with a secondary peak in November. In the southern towns of Iringa and Mbeya the lowest margins are recorded later in the year, in September and October, respectively. The highest margins of these towns generally fall a little later than their northern counterparts, occurring from April to June. Morogoro has a pattern that does not fall easily into either group. It begins the year with a rise to a peak of TShs 5.55 in April, but the next five months which follow are characterised by low mean margins, the lowest occurring in May at minus TShs 6.04. Finally, the last three months of the year are among the highest mean monthly margins recorded in this town; indeed December records the highest at TShs 5.67.

Lushoto, Iringa and Mbeya all maintain a positive margin of between TShs 10 and TShs 20. In each of these towns the highest margin recorded is in May. There are three distinguishable troughs of margins in each of the four towns, occurring in April, July and September/October.

Lushoto, Iringa and Morogoro are described as the main surplus areas of cabbages in Tanzania by the MDB report in 1985. The report goes on to say that the price is mainly a function of these areas' supply to the other regions of the country. However, there appears to be some confusion over the data presented in the report. The data used to describe the supply of fruit and vegetables are based on a survey carried out in 1975 (Marketing Development Bureau, 1975). However, this 1975 survey describes Iringa as the main surplus producing region of cabbages, based mainly on a peak of production which occurred in the first half of the year. A MDB report published in 1986 suggests that this situation has changed and that Iringa's main production occurs in the second half of the year, and that little or no production takes place in the first half of the year.

A group interview carried out by the author with tally clerks at Kariakoo Wholesale Market suggests that Lushoto is the main supply area for Dar es Salaam. Because of the sheer size of the Dar es Salaam market it can safely be presumed that Iringa is the main national surplus producer. This presumption suggests that Lushoto has increased in importance relative to Iringa as a supplier for the country's largest market. Iringa and Lushoto share similar patterns of

Figure 7.8 The Market Margins for Deflated Monthly Cabbage Prices in Dar es Salaam and the Main Supply Area Market Towns (TShs per kilogram).



mean monthly price variation, though, in terms of size of margin, Lushoto appears to have the clear advantage.

Coconut (Figure 7.9)

In Tanga a significant margin occurs throughout the year. The highest margins for coconuts in the selected towns occurred in Tanga, but high margins are only sustained for five months, from TShs 5.81 per nut in December, to TShs 6.88 in January and TShs 7.08 in March, and back to TShs 5.60 by April. The price margins decline in April and May to a level of about TShs 2, declining further to TShs 1.50 in August and rising to around TShs 1.90 between September and November to before climbing in December to TShs 5.81.

In Tanga a period of higher mean price margins begins in December and builds up to the peak of TShs 7.08 per nut in March, thereafter the margin stabilises at about TShs 2, from May to about November, after which the margin rises again, ending the year with a mean margin of TShs 5.81.

Mbeya and Lushoto remain relatively close to the zero margin level, meaning that the prices recorded in Dar es Salaam are at the same level as these two towns which are relatively distant from the main coconut producing areas. Lushoto shadows the Dar es Salaam price particularly closely, only once recording a mean margin of more than TShs 3 difference from the Dar es Salaam prices, but with a margin of minus TShs 14.96 in July. This is the same month when Tanga records its lowest margin. From May to November, however, an almost consistently negative mean margin was recorded in both towns. In Lushoto the margin is generally between about minus TShs 2 and positive TShs 2. Mbeya, meanwhile, has a marked undulating pattern, peaking in March at TShs 2.13 and reaching a trough in September of minus TShs 6.54.

Clearly the highest margins for coconuts in the towns selected occur in the earlier part of the year, from about January or February to April. There then follows a low point from May to November. The November low is followed in December by a rise in the mean market margin of about TShs 3 in most cases.

Irish Potatoes (Figure 7.10)

Mbeya records the highest mean Irish potato price margin of this data set at TShs 15.29 per kilogram. This peak occurred in March and is followed by a series of relatively high margins declining gradually over the year to TShs 8.08 per kilogram in November and a slight rise in December to TShs 11.76.

Lushoto, Iringa, Morogoro and Mbeya sustain a positive mean margin throughout the year. In each case the highest margins are generally towards the early part of the year, for example Morogoro peaks in March with TShs 14.21, but generally remains between about TShs 2 and TShs 4. Lushoto has margins of between TShs 8 and TShs 11, but July and August recorded

Figure 7.9 The Market Margins for Deflated Monthly Coconut Prices in Dar es Salaam and the Main Supply Area Market Towns (TShs per nut).

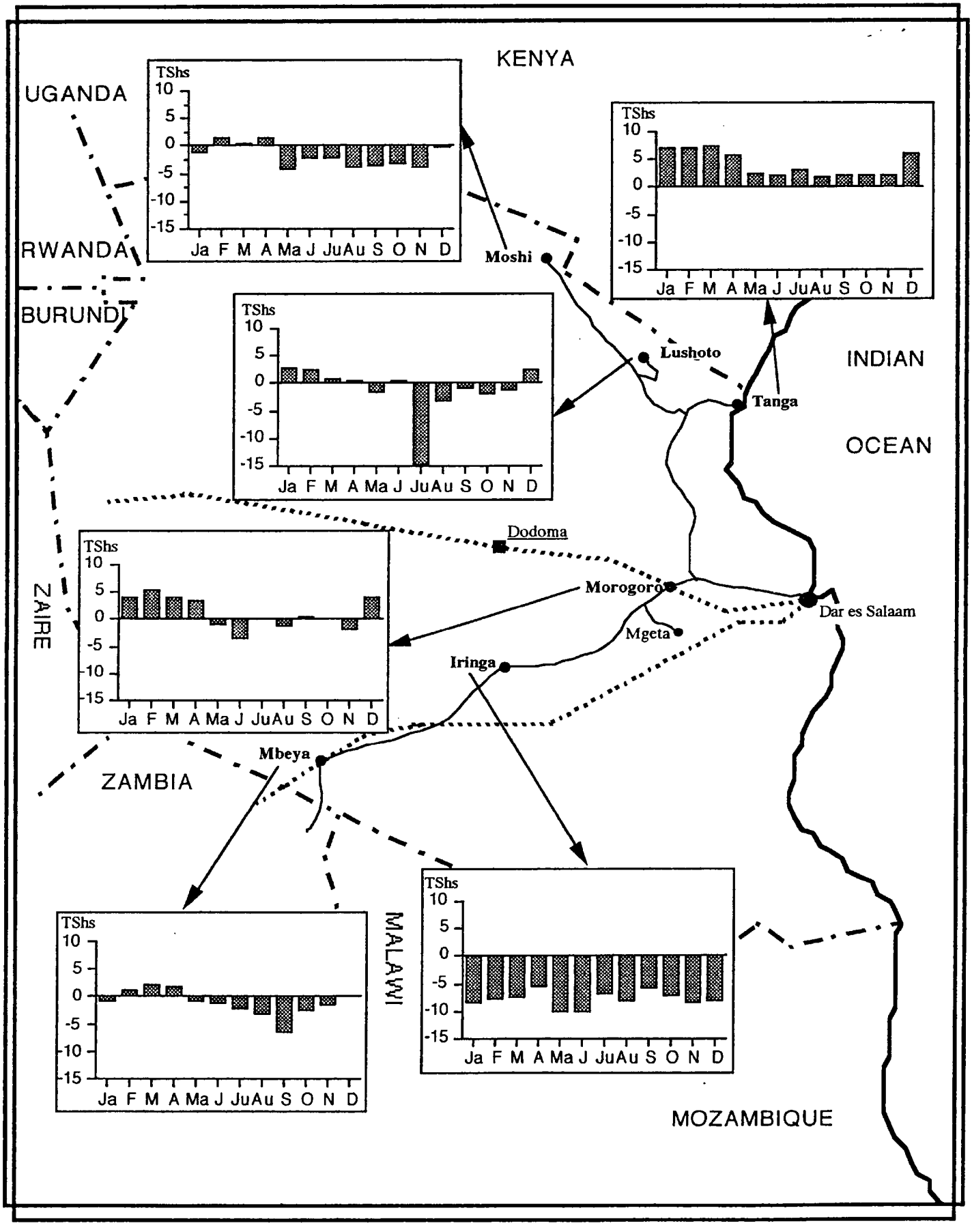
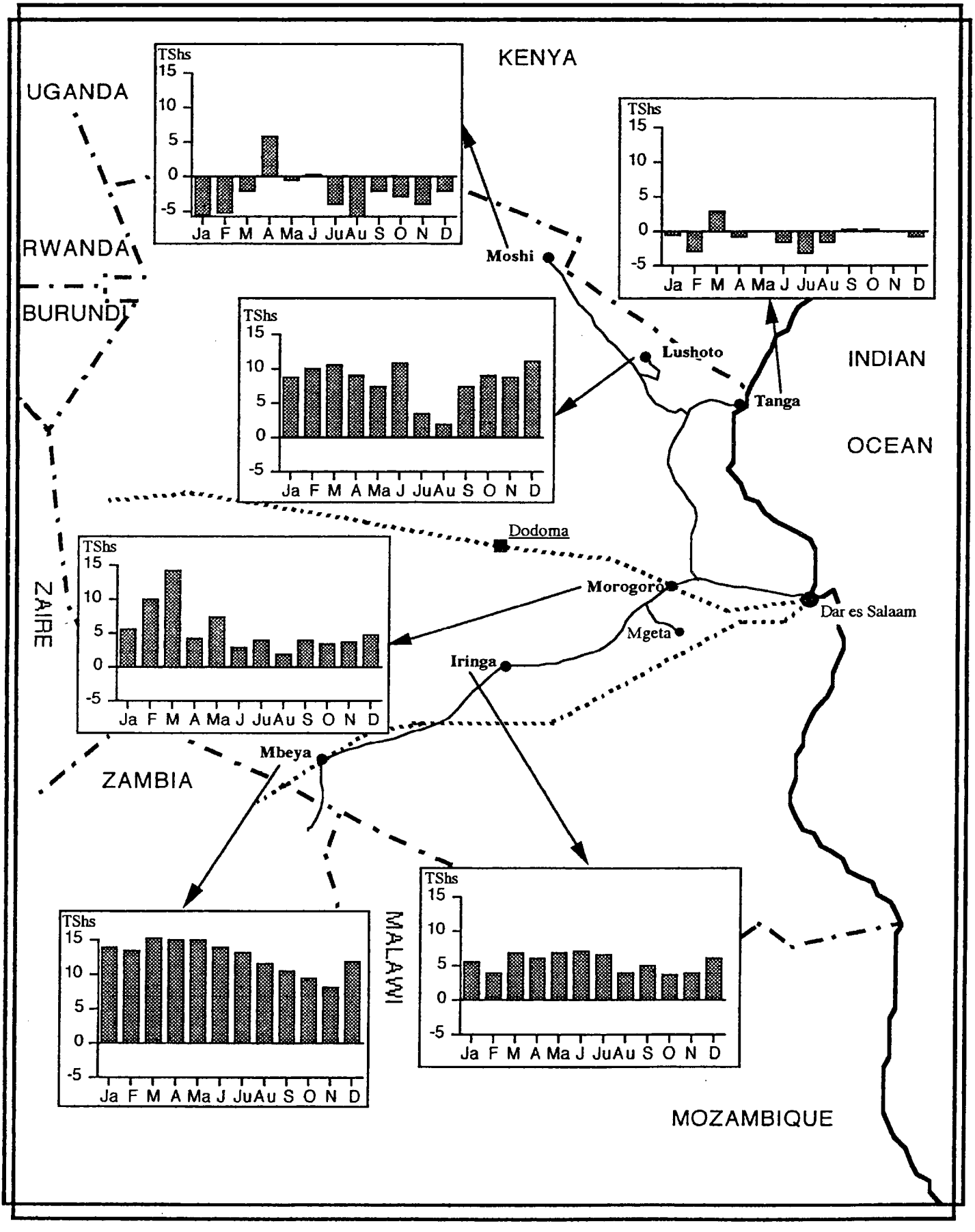


Figure 7.10 The Market Margins for Deflated Monthly Irish Potato Prices in Dar es Salaam and the Main Supply Area Market Towns (TShs per kilogram).



TShs 3.52 and TShs 1.80 respectively and December TShs 11.10. Iringa remains between about TShs 4.00 (in February, August, October and November) and TShs 6.00, exceeding this from March (TShs 6.83) to July (TShs 6.71), with a peak of TShs 7.08 in June.

Tanga and Moshi have 9 or 10 months where their margins are negative, meaning their market prices are higher than in Dar es Salaam. In each case the worst margins are clustered at two different months of the year, for example in Tanga the lowest margins are focused on February and July and in Moshi they are focused on January and August. While Tanga is located at low altitudes, near the coast, and is therefore not ideal growing conditions for Irish potatoes, Kilimanjaro Region, where Moshi is located, is considered one of the most important national Irish potato producing regions . This, however, makes an explanation of Moshi's price margin pattern more problematic, since it resembles the net consuming areas more closely than the other main producing areas.

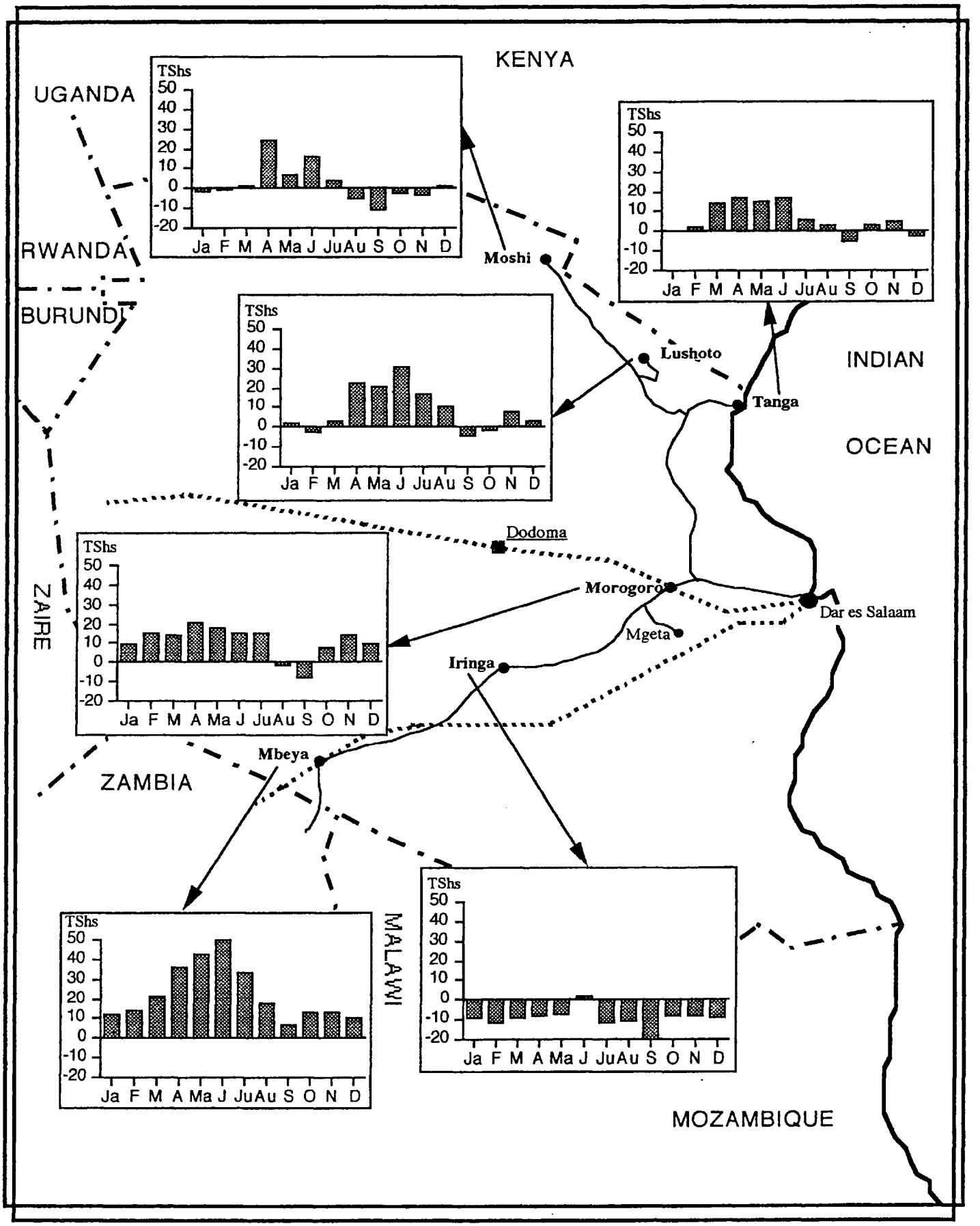
The MDB report in 1986 describes Mbeya and Kilimanjaro as the two most important areas producing Irish potatoes. This is confirmed by the Kariakoo wholesale market group interview carried out by the author. However, the report goes on to argue that two peak periods of Irish potato supply, associated with low prices, which are linked with peak production in these two key areas, can be identified. In Mbeya peak production is said to occur from March to June, while in Kilimanjaro the peaks are said to occur from September to February. Mbeya's mean market price margins show a gradual change throughout the year, but the largest margins do in fact occur between March and June. Moshi's market price margin indicates that the price there was at least TShs 2.08 higher than the Dar es Salaam price between September and February, reaching a price TShs 5.52 higher than that recorded in Dar es Salaam, or a mean margin of minus TShs 5.52.

Onions (Figure 7.11)

The most notable feature of the barcharts for the mean monthly onion price margin, is the geographically consistent low margin in September. In every town the September margin is significantly lower than the other monthly margins. Only in Mbeya does the August margin remain positive, although it falls from a differential of TShs 17.92 per kilogram in July to TShs 6. The second notable feature of these barcharts are that the highest margins for onions occur between the months of April and June, inclusive. The latter half of the year is characterised, in these mean margin figures, by a relatively low, but positive market margin.

Mbeya records the highest market margin for this particular commodity at TShs 49.33 per kilogram in June. Lushoto is nearest, recording a peak margin of TShs 30.10 in the same month. June is also a relatively good month for onions in Iringa, when the price of onions, which is higher than Dar es Salaam for the rest of the year, falls below the Dar es Salaam price by TShs 1.75. This causes the otherwise negative margin to become positive for that one month.

Figure 7.11 The Market Margins for Deflated Monthly Onion Prices in Dar es Salaam and the Main Supply Area Market Towns (TShs per kilogram).



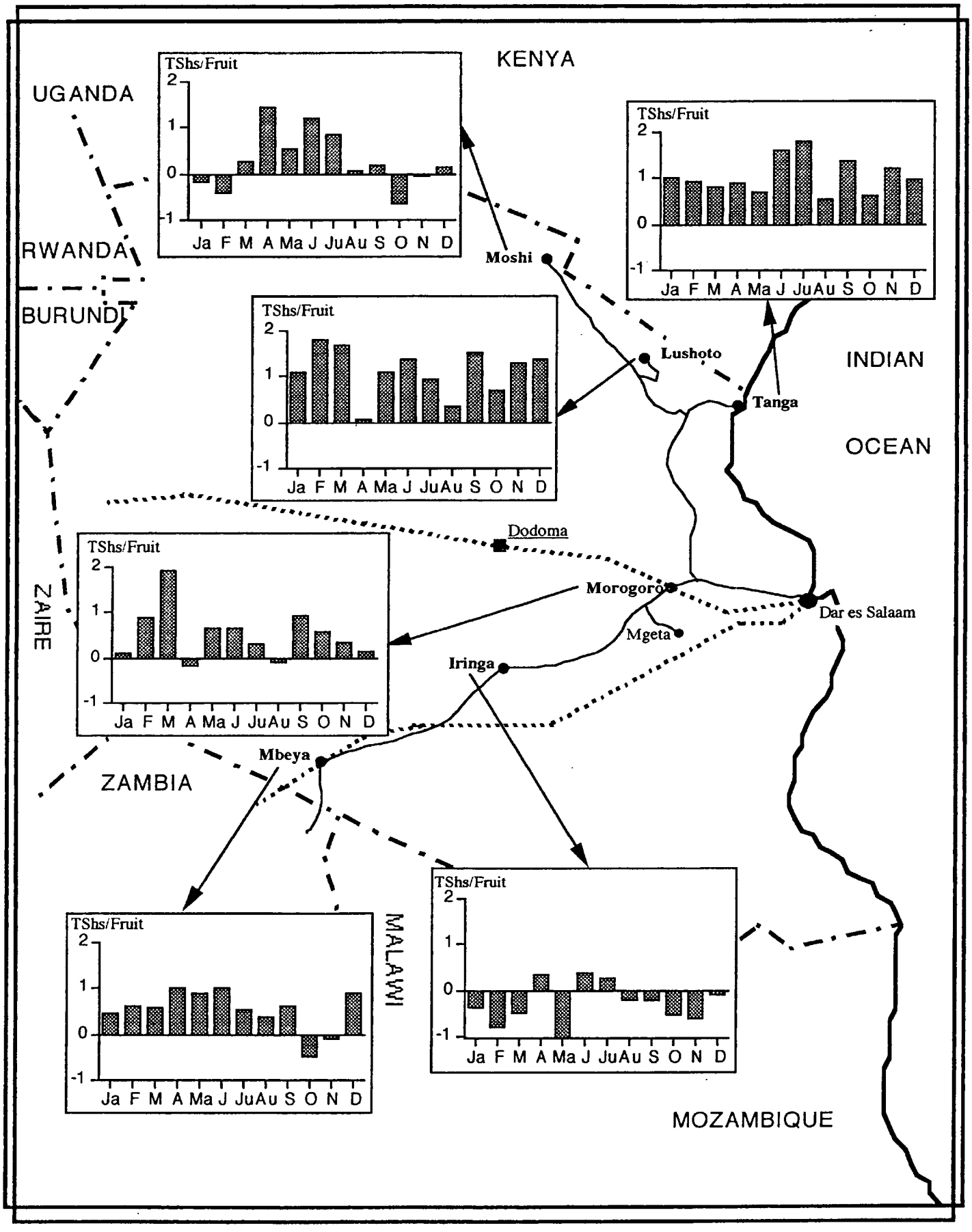
In spite of the fact that onions have a relatively long storage life, it appears that the traders and farmers involved in producing and supplying this vegetable are reluctant to store it in order to take advantage of the more favourable prices which may occur later in the season (Marketing Development Bureau, 1986). Given the correct conditions and preparation, onions can be stored for up to 8 months before resale (Food and Agricultural Organisation, 1989). This has clear implications for the possible returns on a traders investment, or on the returns to a producer. The important requirement in order to allow a trader or farmer to be able to store in this way is the initial investment. Firstly, suitable storage facilities are required in order to provide the storage conditions required. Secondly, the time between the initial investment and the return is increased. This can be particularly important for a farmer who requires a relatively quick return on his initial investment in terms of inputs, labour and so on. Where the financial backing does not exist, therefore, storage will be very difficult. In the situation of onions, the high relative prices per kilogram may in fact provide the economic incentive to traders to store their purchases in order to gain from more favourable prices. This is beneficial to the rural areas if the storage takes place there, as the added return comes back there. It also benefits the urban area in that it provides an incentive for traders and producers to provide produce in periods of shortage when the price is higher. The ideal result of this will be a lowering and stabilising of the price of onions as the supply becomes more stable.

Oranges (Figure 7.12)

There is little in the way of a distinctive overall pattern to be found in the mean monthly orange market price margins. The two towns, closest to the main supply areas are Tanga and Lushoto, which are closest to Korogwe District in Tanga Region, possibly the largest orange producing area in Tanzania (Seminar für Landwirtschaftliche Entwicklung, 1986), and Morogoro, which is close to the orange growing areas on the Uluguru Mountains. This proximity ought to be reflected in their higher margins. In Lushoto, this appears to be true, while Tanga, on the other hand, remains throughout the year at a low margin of around TShs 1.00 per fruit. The margins peak at TShs 1.80 in July. The last six months involve a variation in the margin between about TShs 0.60 in August and to about TShs 1.25 in the intervening months. In Morogoro the margin is even lower than in Tanga, except in March when the margin reaches a peak of TShs 1.95. In the months of April and August the price appears to be greater in Morogoro than in Dar es Salaam. Morogoro is a centre of high demand, and it is likely that this has an effect on the cost of the fruit delivered at the retail market. The times when the margin is low, or even negative are likely to reflect periods of low production around the town. In addition, March is the beginning of the wet season, and any supplies from other ares of the country, for example Tanga Region, would have difficulty in getting through to Morogoro.

Morogoro is also relatively close to Matombo in the Uluguru Mountains, an important orange producing area which supplies both Morogoro and Dar es Salaam. Morogoro begins the year with a low margin, climbing to TShs 1.95 in March. The margins that follow remain at around

Figure 7.12 The Market Margins for Deflated Monthly Orange Prices in Dar es Salaam and the Main Supply Area Market Towns (TShs per fruit).



TShs 0.60 up to November, with the notable exceptions of April and August, when the margin falls to minus TShs 0.17 and minus TShs 0.06. The last four months of the year are characterised in these mean margins as declining steadily from TShs 0.94 in September to TShs 0.17 in December.

Moshi and Iringa are both net consuming areas and this is reflected in their much lower mean margins. As the most distant represented towns in this set of data they are also the only ones whose margins most frequently fall below the zero mark, indicating that their market prices were higher than those of Dar es Salaam. These negative margins, or at least low margins, occurred early in the year and in the months from August to November in both towns. The most favourable margins in Moshi occurred in April, with TShs 1.46 per fruit, followed by a decline to minus TShs 0.65 in October. In Iringa the strongest mean margin occurred in June, with TShs 0.39. The distance of these markets from orange supplying areas suggest that the price variations are less likely to be the function of varying supply, but the result of varying demand. The demand for a fruit such as oranges is likely to be affected by the climatic season - the warmer and drier the season the more likely there will be high demand for the thirst-quenching qualities of an orange. The demand is also likely to be affected by the supply of alternative fruits, as they come into season and under-cut the price of the orange. This seasonal introduction of a lower-priced fruit may come about because the fruit is a type which is produced closer to these two towns. An example of this type of commodity competition can be found in the production of the more temperate fruits to be found in Moshi and Iringa, such as apples, pears and sweet bananas.

Sweet Bananas (Figure 7.13)

The evidence of market price margins presented in the barcharts of sweet banana data, characterises the variations of price margin for this fruit as building up to a peak in the middle of the year. This is particularly clearly demonstrated in the margins for Tanga, Lushoto, Moshi, and Mbeya. July is generally when the peak margin occurs after which relatively stable mean margins occur about TShs 1 per fruit lower than the July peak.

Lushoto and Mbeya all record price margins of about the same level of between TShs 0.50 and TShs 2.00 per fruit. In Tanga, although the pattern described by the data is similar, the scale is smaller, with the mean price margins varying from about TShs 0.10 to TShs 1.00. In all cases, except Morogoro, June and July are the months which record the highest mean monthly margins. Morogoro's peak margins occur in the month of April at TShs 0.69 and in July, when the margin is about TShs 0.65.

Tomatoes (Figure 7.14)

The evidence presented in the mean monthly price margins for tomatoes suggests that in most cases the margin between the supply towns and Dar es Salaam are greatest in the months of

Figure 7.13 The Market Margins for Deflated Monthly Sweet Banana Prices in Dar es Salaam and the Main Supply Area Market Towns (TShs per fruit).

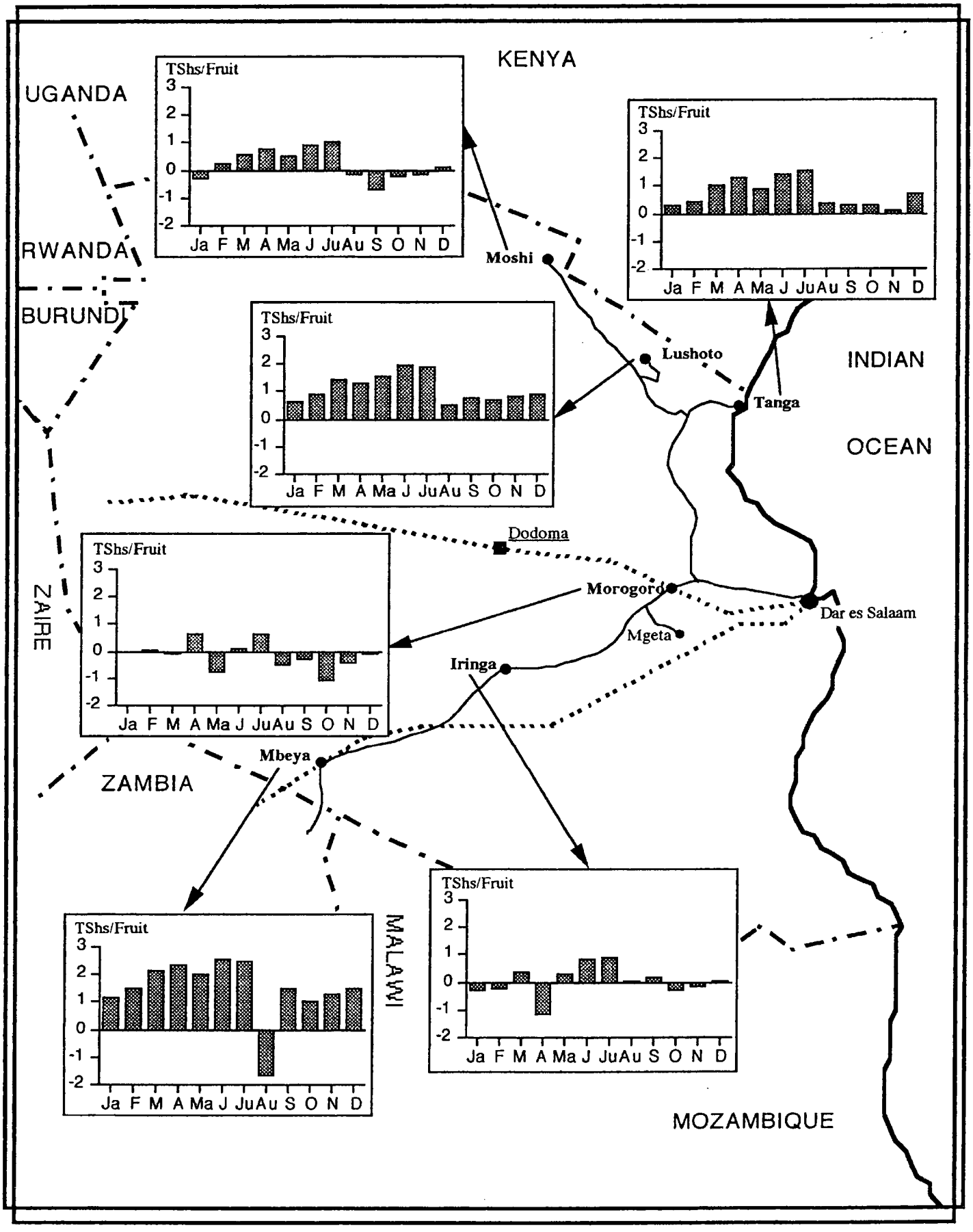
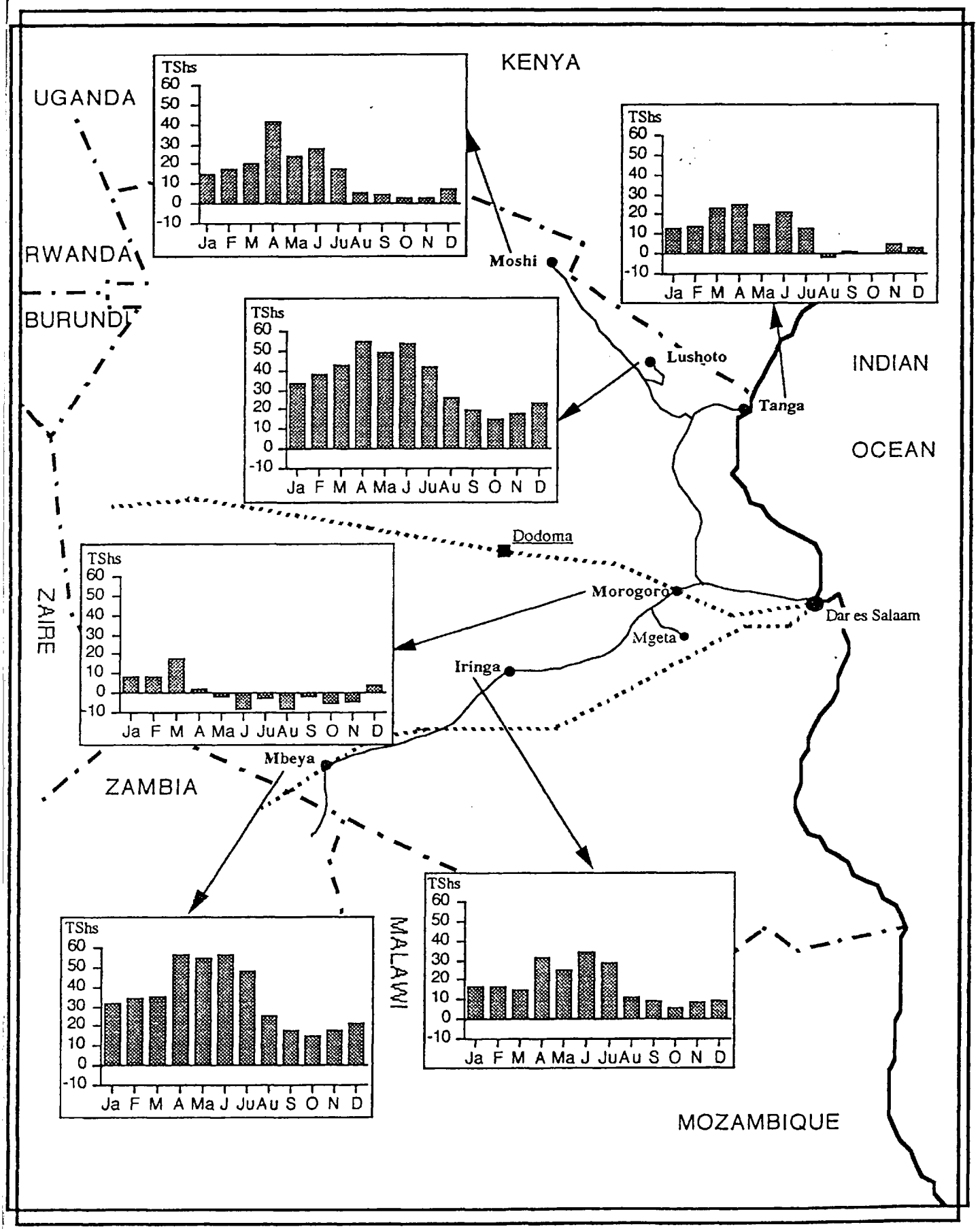


Figure 7.14 The Market Margins for Deflated Monthly Tomato Prices in Dar es Salaam and the Main Supply Area Market Towns (TShs per kilogram).



the early-to-middle part of the year. Mbeya and Iringa both have their peak margins in the months of May, June and July. Tanga, Moshi and Morogoro have their peak margins in the months of April and May. Lushoto has two peaks of very similar proportions, one at TShs 53.23 in June and one at TShs 54.54 in July. In addition to this difference, Iringa, Mbeya and Lushoto also have a more prolonged peak price margin in common, which in each case is sustained over the three months mentioned. The latter group, however, has a clear peak in only one of the months mentioned.

7.3 Model Supply Strategy for Dar es Salaam

This section will examine the highest mean monthly margins achieved for each of the commodities highlighted in the data taken from the Marketing Development Bureau's monthly market price data. The highest market price margin between the Dar es Salaam retail price and the prices recorded in the six other towns, which are located in or close to important fruit or vegetable producing areas, will be presented for each month. This exercise is intended to give an indication of the area which is in the strongest position, in terms of mean price advantage to deliver that commodity in each month, using the price margin as a criterion of strength. Clearly, this has important potential for identifying the key months when it is advantageous for an area to target, as well as providing strategically important market information for planners and traders alike. However, one caveat must be discussed before analysing this data. The apparent price advantage of one town over another, based on the retail prices of the commodities discussed, does not guarantee that the area represented by the towns will necessarily be in a strong position based on other criteria, such as environmental conditions.

Figure 7.15 presents the data for the price margins for cabbages. This barchart is dominated by the price margins recorded in Lushoto. The District of Lushoto is well known for cabbage production and it is an important supplier of cabbage and other leafy vegetables to Dar es Salaam. The Lushoto price margins are at their highest from August through to March, ranging from TShs 12.96 in September to the highest at TShs 20.23 in February. Other centres which record the highest mean monthly margins include Mbeya and Iringa. Mbeya records the highest mean monthly margin in August at TShs 13.55, although previously it had recorded higher margins in April to June. In Iringa the highest price margins begin in April at TShs 22.51 and continue through to July when the highest price margin is July when the highest margin has declined to TShs 11.95. This is the only commodity in which Iringa achieves the highest margin of the six centres examined for this study. Iringa manages to maintains a minimum price margin of no less than TShs 10.00 throughout the year.

Figure 7.15 Highest Mean Monthly Price Margins for Cabbages between Dar es Salaam and its Main Supply Market Towns (TShs per kilogram)

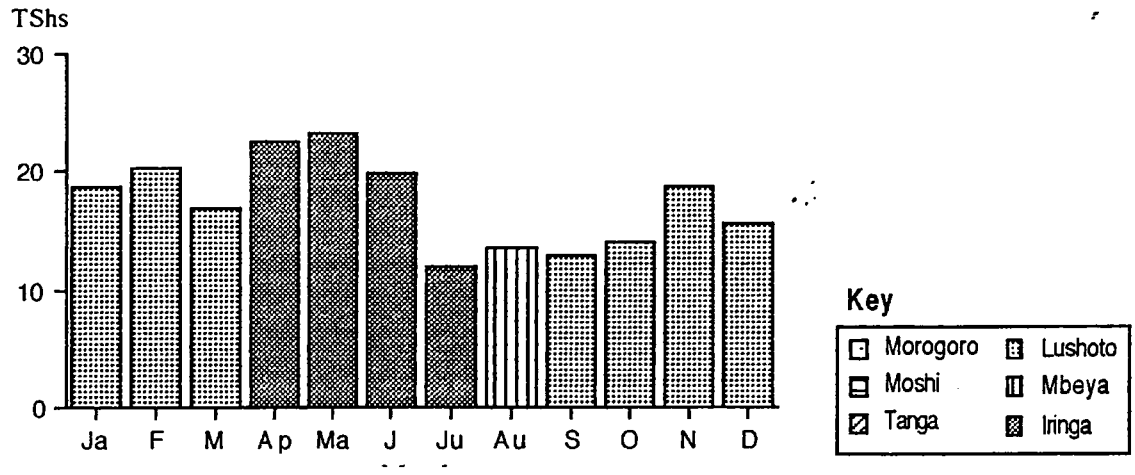
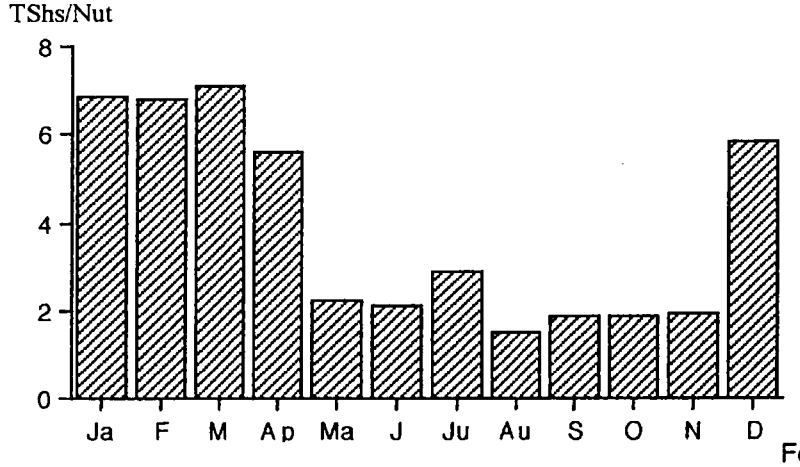


Figure 7.16 presents the highest mean monthly price margins for coconuts between Dar es Salaam and its main supply towns. This barchart is entirely given over to the price margins of Tanga, which has the highest mean monthly price margins for every month of the year. This is a reflection of the coastal environment for the production of coconuts. Because of the way in which the data were collected, concentrating on towns in areas important for a broad range of commodities, it is not possible to reflect the importance of Coast Region around Dar es Salaam and the islands of Pemba and Unguja, which are also important sources of the supply of coconuts to the city. The main price margins range from TShs 7.08 per nut during March down to a low of TShs 1.88 which occurs in both September and October. The times when Tanga's price margin is at its strongest is from December through to April, when the price is between about TShs 6 and TShs 7, and at its weakest from March through to November, when the price is at around TShs 2 for those seven months.

Figure 7.16 Highest Mean Monthly Price Margins for Coconuts between Dar es Salaam and its Main Supply Market Towns



For key see Figure7.15

The data presented in Figure 7.17 are taken from the mean monthly price margins for Irish potatoes. This barchart is also dominated by the price margins from Mbeya. There is only one

month when the price margins of Mbeya are exceeded by another town, namely Lushoto, which achieves the lowest of the year at TShs 8.74. The general pattern is a modest increase at the beginning of the year to around TShs 15, which is maintained from March through to May, when a price margin decline begins reaching TShs 8.74 in Lushoto, which is in turn followed by a modest increase to TShs 11.76 Mbeya in December. Once again this demonstrates the high potential of Mbeya as a temperate vegetable producing area. Indeed, the Marketing Development Bureau (1986) confirms the importance of Mbeya, explaining that it sends potatoes to Dar es Salaam from January right through to September, but it also supplies most of the southern part of the country and parts of the north at certain times of year. It also maintains that the Kilimanjaro area around Moshi is an important area for the production of Irish potatoes. The price data, however, do not appear to bear this out, as the price of potatoes in Moshi is apparently higher than in Dar es Salaam for ten out of the twelve months of the year. This is because of the importance of Moshi as a potato consuming area.

Figure 7.17 Highest Mean Monthly Price Margins for Irish Potatoes between Dar es Salaam and its Main Supply Market Towns

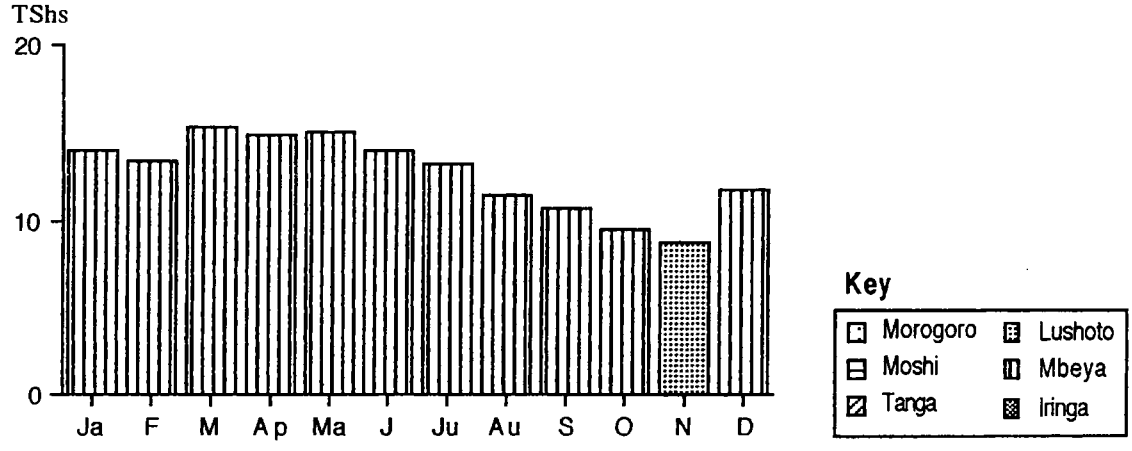


Figure 7.18 presents the data for the mean monthly price margins for onions. This barchart is once again dominated by the town of Mbeya, which has the highest margin for ten out of the twelve months of the year. The highest monthly margins of February and November are recorded by Morogoro. The barchart has a quite distinct peak in market margins in the month of June, when the margin is recorded at TShs 49.33. The pattern climbs from TShs 12.38 in January to the peak in June and then decline to TShs 6.00 in September. This is followed by a relatively modest climb to TShs 13 in November and a small decline in December. This demonstrates the importance of Mbeya as an onion producing area and the importance of its supply to Dar es Salaam. According to the Marketing Development Bureau, Singida, Iringa and Arusha are the most important onion producing areas in Tanzania, the periods of supply occurring from April to October in Singida, June to January in Iringa and September to February or March in Arusha. The result is that onion supply to Dar es Salaam is almost continuous, with a short period of low supply between February, when supply begins to decline in Arusha, and April, when the supply from Singida begins.

Figure 7.18 Highest Mean Monthly Price Margins for Onions between Dar es Salaam and its Main Supply Market Towns

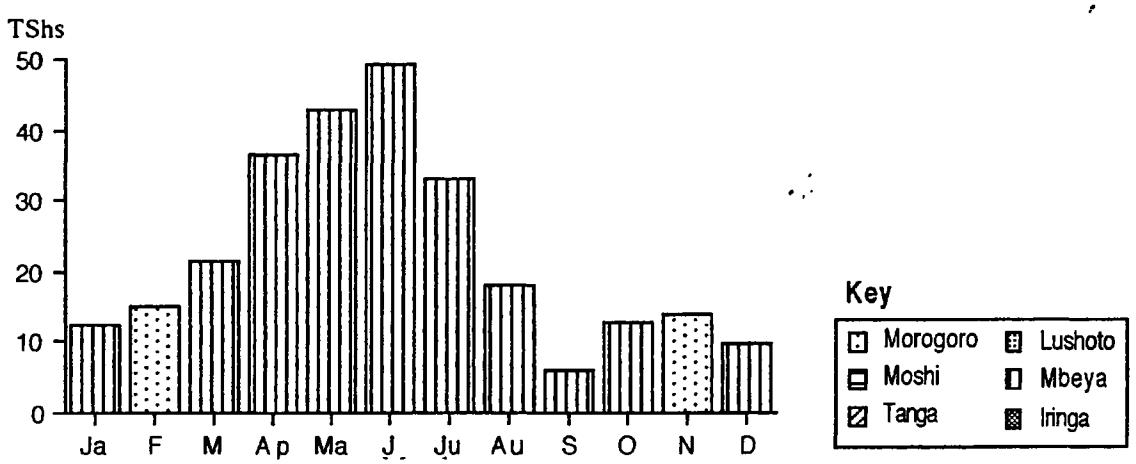
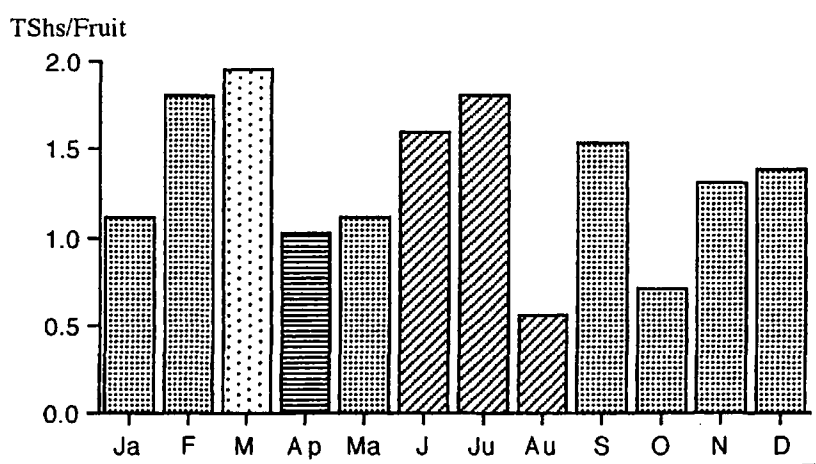


Figure 7.19 presents the data for the price margins of oranges. This reflects a relatively mixed distribution of high margins during the year, although it is dominated by the margins achieved in Lushoto. Although the area around Lushoto is not an orange producing area itself, its proximity to the orange groves of Korogwe is likely to benefit the retail price which is recorded in Lushoto. The result is that Lushoto records the highest mean monthly margin for eight out of the twelve months of the year, namely from September to February, and also in May. The margins recorded range from TShs 0.71 per orange in October to TShs 1.81 in February. The other towns which achieve the highest orange market price margins include Morogoro which achieves TShs 1.95 in March. This is more understandable as Morogoro town is close to the area around Matombo village, where large volumes of oranges are produced and transported to Morogoro town and Dar es Salaam.

Figure 7.19 Highest Mean Monthly Price Margins for Oranges between Dar es Salaam and its Main Supply Market Towns



For key see Figure 7.18

The following month, April, records a margin of TShs 1.46 in Moshi. This is surprising, as Moshi is further inland than Korogwe. The likely explanation may involve the difficulty of transporting

oranges, or indeed, any commodities at the beginning of the rainy season. The relatively good condition of the roads towards Moshi may result in the oranges being taken there instead of Dar es Salaam, in the hope that they are more likely to arrive in reasonable condition. The high demand in Dar es Salaam, which is not being met because of the difficulties of the road conditions, coupled to the lower prices in Moshi, as a result of the higher than expected supply, may result in this anomalous price margin. Three months of high market margins are recorded in Tanga Region from June to August. This is more easily explained by the importance of orange production in Tanga Region, not only around Korogwe, but also near Handeni and close to Tanga town itself. The last four months of the year are dominated by the margins recorded in Lushoto, the result of the importance of orange growing on the plains relatively close to Lushoto.

Figure 7.20 Highest Mean Monthly Price Margin for Sweet Bananas between Dar es Salaam and its Main Supply Market Towns

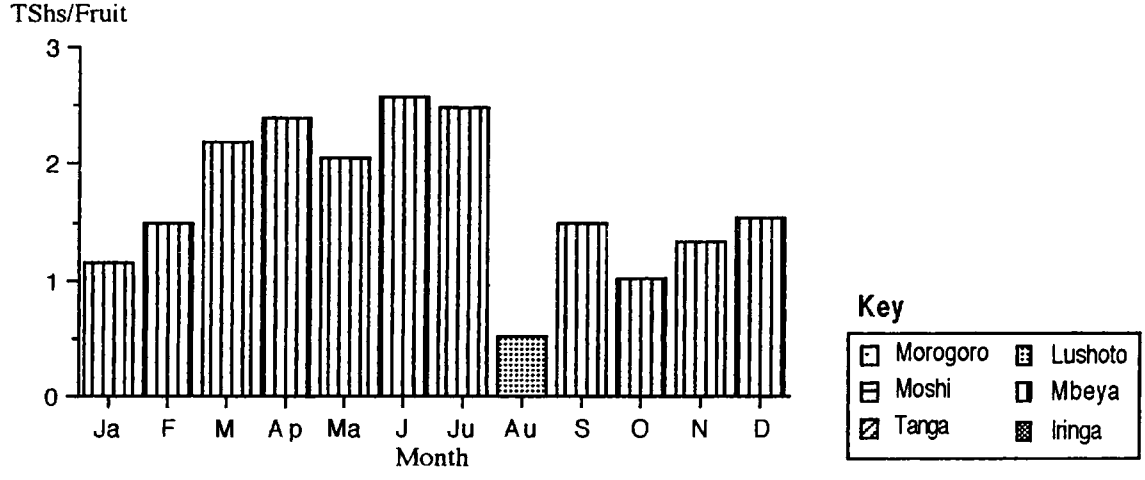
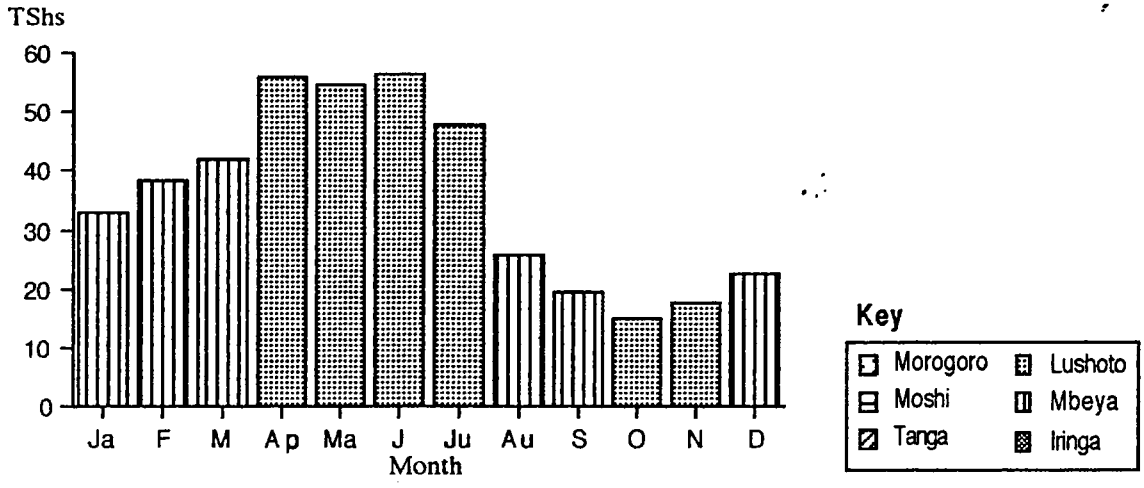


Figure 7.20 presents the highest mean market margins for sweet bananas. This barchart is also dominated by the market margins achieved in Mbeya, which account for the highest market margins for every month of the year, except for August, when Lushoto exceeds the Mbeya price margin. The price margins in Mbeya range from TShs -1.66 per fruit (in other words the price in Mbeya exceeded the price in Dar es Salaam by TShs 1.66 per fruit), in August, when the price margin is exceeded by the Lushoto margin, to TShs 2.58 in June. The high margins recorded in Mbeya mask the relatively high margins recorded in Lushoto and Tanga in June and July, when price margins are around TShs 1.9 and TShs 1.5 respectively. Once again the importance of Mbeya for the production of bananas, and, indeed, many other types of food is clearly demonstrated by the barchart in Figure 7.20.

Figure 7.21 Highest Mean Monthly Price Margin for Tomatoes between Dar es Salaam and its Main Supply Market Towns



Finally, the data presented in Figure 7.21 is that of the highest mean market margins from tomatoes. The margins recorded in Lushoto and Mbeya dominate this barchart, each accounting for six months. The year begins with increasing tomato margins recorded in Mbeya, rising from TShs 32.87 per kilogram January to TShs 41.948 in March. The months of April to July are dominated by the tomato margins recorded in Lushoto, which remain at around TShs 55 until a decline begins in July, towards the end of the long dry season. In August the tomato margins from Mbeya are once more at the highest recording a decline from TShs 25.65 in August to TShs 19.44 in September. In October and November the highest margins are recorded once more in Lushoto, during the short rainy season rising from TShs 15.10 to TShs 17.76. The last highest monthly tomato price margin of the year is recorded at TShs 22.57 in Mbeya. This reflects the importance of these two areas for the production of tomatoes for the Dar es Salaam market, as reported by the officials at Kariakoo and by the producers in Lushoto, who felt they had to compete with other areas, particularly Mbeya, to supply the city's tomato demand. However, in both cases the point was made that, despite the possibility of producing tomatoes all year round in both areas, the environmental conditions in each area were most favourable for tomato growing at different times of the year. The result of this is apparently the type of complementarity in the supply of tomatoes from each area during the course of the year, with margins perhaps reflecting a favourable period for Mbeya in the first three months of the year, and in Lushoto in the next four months, with both areas relatively closely matched in the latter five months.

7.4 The Performance of the Main Market Towns

Morogoro

Morogoro town has its own highly developed market with a relatively high local urban demand for food, particularly as a result of recent rapid urban expansion due to considerable industrial

investment in the town. Consequently, prices in Morogoro town are frequently at levels similar to those found in Dar es Salaam itself. Many of the fruit and vegetables produced in Morogoro Region are produced in the Region's higher, more temperate areas, or where irrigation has been developed on the plain surrounding the town itself. The high demand has translated into a relatively high price in Morogoro's retail markets, resulting in the Morogoro price being under-represented among the producing areas in this analysis.

Morogoro records the highest price margin for oranges. The main orange growing area in Morogoro is at Matombo in the east of the Uluguru Mountains (see Figure 4.26). This area is approximately 30 km from Morogoro, connected by a very poor road. Oranges transported to Dar es Salaam do not pass through Morogoro town, although much of what is produced in Matombo is also sold in Morogoro, as this is a market which can command a relatively high price.

Morogoro also records the highest price margin for onions in both February and November. The fact that Morogoro is located on the main road from Mbeya to Dar es Salaam results in Morogoro town prices benefiting from supply both from the surrounding area, but also from Mbeya. This may have resulted in a lower price, and, consequently, a higher price margin, by a small factor, than was recorded in Mbeya in the months of February and November when Morogoro's price margin exceeded Mbeya's. In addition, one would expect Morogoro to benefit from its location, on the route from Singida, the nation's biggest onion producing area, to Dar es Salaam.

Tanga

Tanga records the highest monthly price margins for coconuts for the entire year, the highest of which, as has been described, occurring in December and the first four months of the year. According to the Marketing Development Bureau report (1986), the highest yields of coconuts are usually obtained in the middle of the year. The last three months of the year are when supplies are at their lowest, and the prices at their highest. This is a period of high demand, when coconuts are added to the ingredients of meals as the festivities of Christmas draw near. If it were possible for Tanga to produce coconuts at this time, it would benefit Tanga in revenue gained from their sale to Dar es Salaam dealers, and it would benefit Dar es Salaam by providing more coconuts at a time when they are in short supply. However, the pattern presented in Figure 7.16 suggests that other supply sources, such as Coast Region and the islands, are of enormous significance in the supply for Dar es Salaam. It is possible that the main production in Tanga Region occurs during the months from December to April, reflected in the high price margins. However, it seems likely that during the times when coconuts margins in Tanga are recorded at about TShs 2 per nut, from May to November, other sources not covered by this analysis, such as Mafia Island or areas on the coast south of the Dar es Salaam, are supplying the city.

Tanga benefits from proximity to the orange groves in Korogwe, Handeni and, to a lesser extent around the town of Tanga itself. This is reflected in Tanga recording the highest margins for oranges in the months of July to August.

Lushoto

Lushoto has one of the strongest mean monthly price margin profiles of the towns discussed in this chapter. It achieves highest price margins in all commodities except coconuts, indicating a high potential price advantage. Lushoto District has a strong reputation as a fruit and vegetable producing area, both in terms of volume and especially in terms of quality. However, its importance in the data concerning oranges, where it commands the highest mean margins in seven months, is, as has been explained already, a little misleading. It may well be that those traders transporting to Tanga or Dar es Salaam, fill their lorries on their upward journey, in order to supply Lushoto. The author's own experience of travelling to Lushoto included two stops so that the driver of the aid agency vehicle, in which he was travelling, could negotiate the purchase of a *gunia* of oranges and one of mangoes. These he intended to sell on arrival in Lushoto. This is relatively common in most of Tanzania, when people travel on business and are able to carry produce.

Cabbages are a commodity that Lushoto District produces in large quantities and competes with a relatively small number of other areas. In this analysis, Lushoto price margins are highest in seven out of the twelve months of the year, from September to March. Lushoto is also reported as an important tomato producer. This is borne out by the data demonstrating its highest margins in six of the months, but most importantly, in the four months from April to July when it consistently records enormous margins of around TShs 55 per kilogram.

Sweet bananas are reported to be grown in Lushoto, but it is regarded as a more important source of cooking bananas which are successfully inter-cropped with other crops such as tea and coffee (Sender and Smith, 1990). The highest margin recorded for sweet bananas in August is relatively small, and stands out sharply from the rest of the pattern which is dominated by the margins of Mbeya. It does however, suggest that Lushoto has some potential as a sweet banana producing area. This is particularly the case when one considers that the margins recorded in Lushoto, as described already, are relatively close to those in Mbeya.

Irish potatoes are a crop which can, given the correct conditions, be stored for some time very successfully, in order to optimise prices and to reduce shortages at times of the year when the production is low. A second point worth considering in the context of Irish potatoes being produced in Lushoto, is that the mean monthly price in Tanga town exceeds that of Dar es Salaam in nine months out of twelve. Given the proximity of Tanga and the higher margins which could potentially be gained, it would seem a more useful strategy for Lushoto Irish potatoes to be targeted at Tanga, rather than transporting them to Dar es Salaam to compete with,on average, cheaper potatoes from Mbeya.

Lushoto has a demonstrable advantage as a fruit and vegetable producing area, in terms of potential mean monthly price margins. This potential appears to be fulfilled to some extent, according to interviews with Dar es Salaam market officials. However this analysis has pointed to some areas where more serious consideration could be given to optimising the gains from the district's environmental advantage.

Mbeya

Mbeya has the highest number of highest mean monthly price margins of the selected towns in this analysis. While Mbeya Region's more northerly highlands provide the more temperate climates for vegetables and temperate fruits, the southerly plains around Lake Nyasa are well suited for the production of tropical fruits such as mangoes, pineapples and citrus fruits. It records high price margins in all commodities except coconuts and oranges. This strength of margin is reinforced by the reports in interviews, and particularly in the MDB report (Marketing Development Bureau, 1986) of Mbeya's importance, in reality, in the supply of Irish potatoes to Dar es Salaam (Bartlett and Odero-Ogwell, 1976).

Mbeya's most important crop, in terms of the mean monthly price margin criteria, is that of sweet bananas, where it dominates, with eleven of the highest mean monthly margins. Its second most important commodity, according to these criteria, is that of onions, where it commands ten of the highest monthly margins. However, in spite of this potential, Mbeya is not acknowledged as an important surplus region for the production and supply of onions. It was ranked seventh after (in order of importance) Singida, Arusha, Tabora (except during the rainy seasons), Moshi, Iringa and Morogoro (the last three were more or less ranked as equal) as a supplier of onions to Dar es Salaam by the Marketing Development Bureau (1986).

Mbeya also records the highest mean price margins for tomatoes in the months from December to March , and also in August and September. Mbeya's very low mean monthly price margins for many of these commodities, in comparison to the other towns, can in part be explained by its distance from the more highly developed, high demand areas nearer to the coast. Mbeya's distance from the urban markets results in a lower cost of living and generally lower prices. In addition, the higher number of farmers in the District also consume much of their own produce, lowering the demand for retailed food, particularly in staples and less perishable crops which can be stored in the home, such as Irish potatoes, cooking bananas and onions.

Iringa

In contrast to the importance given to Iringa by the MDB (Marketing Development Bureau, 1986), it records surprisingly few entries among the mean monthly price margins in this analysis. The most successful commodity in Iringa appears to be cabbages, which is the only commodity which records a highest monthly price margin in this series. The highest monthly margins,

however. occur in the same months for each of the towns and at the same time as the highest months in absolute mean monthly price. This is perhaps the result of the high demand for these vegetables at that time translated into high prices offered, thus resulting in high prices in the rural areas, as local demand competes with the large, high demand among urban supplying buyers.

Moshi

Moshi, like Iringa, is a town representing a region which is reported as an important producer of fruit and vegetables for the city of Dar es Salaam, and yet it scores comparatively weakly in this analysis. It achieves only the highest mean monthly price margins in one commodity, oranges. The area around Moshi is well-known for its production of vegetables. Hence these results cannot be considered as representative of the types of margins that a trader in Moshi can expect. It is more likely that the high urban demand existing in both Moshi and Arusha, as well as unofficial cross-border trade, has had the effect of increasing the urban retail prices of the commodities dealt with in this analysis. This factor indicates the shortcomings of this use of the data. However, given that this is the case, the results suggest that Moshi has a strong advantage in the commodities in which it does score relatively highly, namely, onions, tomatoes and oranges. The exception is the anomaly of oranges, which once again have scored highly in an area where they are not, in fact, produced. The only explanation for this is that the orange producing districts of Korogwe and Muheza are on the same international routeway as Moshi, which runs from the ports of both Tanga and Dar es Salaam to Uganda, Rwanda and Burundi. This routeway, which is heavily used by large lorries transporting goods both to and from the coast, provides the occasional opoortunity for using available space on the vehicles for goods such as oranges, particularly if the lorry driver is interested in making a little unofficial income to supplement his wages.

This chapter has provided a framework for the analysis of the fruit and vegetable supply system as it operates through the network of market towns supplying Dar es Salaam. The analysis has identified periods in the year when certain areas, are in an economically strong position, in terms of the retail market margins, for supplying Dar es Salaam with fruit and vegetable commodities.

Chapter Eight

Fruit and Vegetable

Farming in The Rural Producing Areas

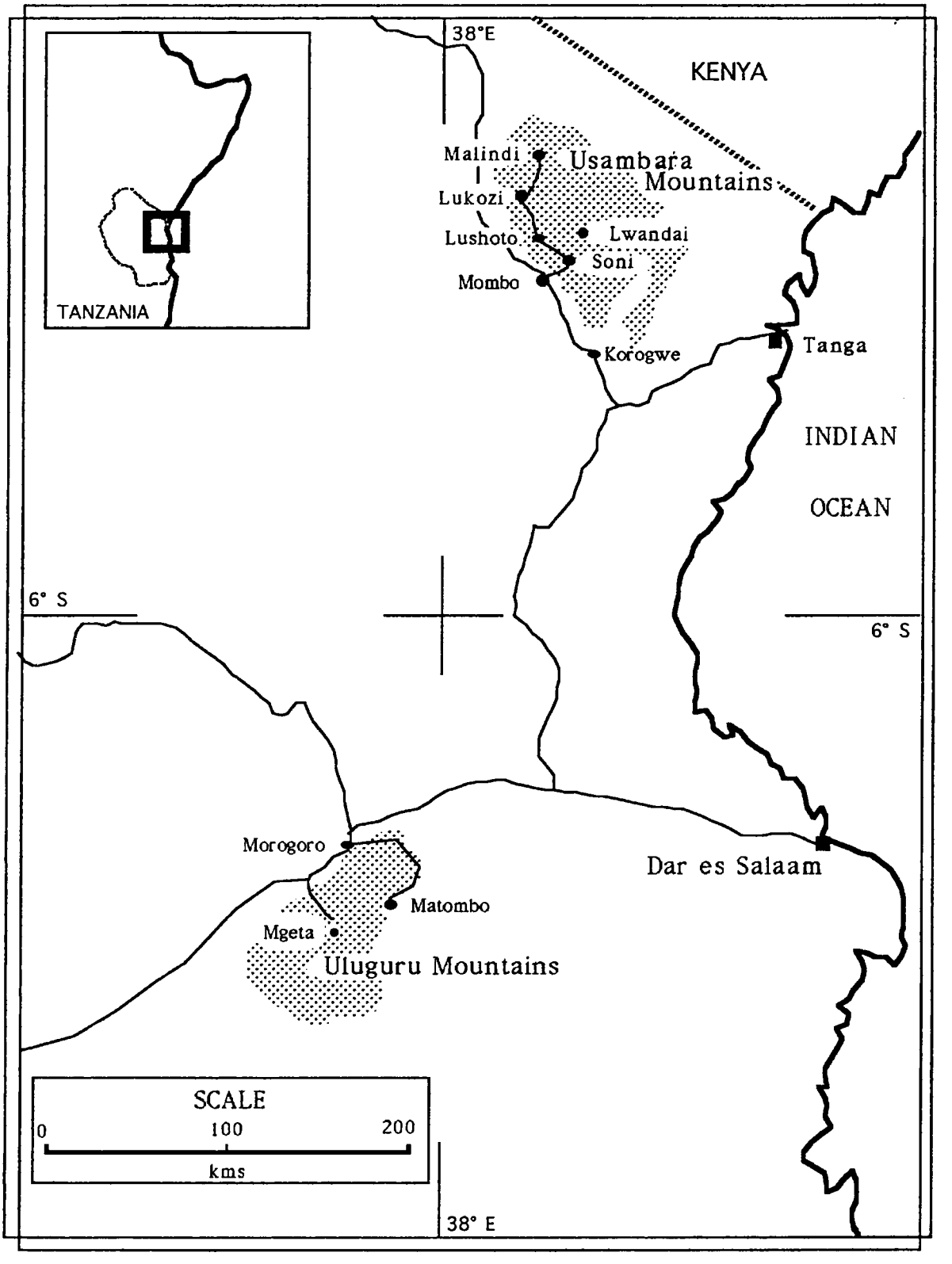
8.1 Introduction

This chapter will examine the results of a questionnaire survey carried out in a total of six villages in two key fruit and vegetable producing areas. These areas are Lushoto District of Tanga Region and Morogoro Rural District of Morogoro Region. As described in Chapter Three both are situated in highland areas and are approximately 300 and 200 kilometres from Dar es Salaam, respectively. Evidence presented in Chapters Five and Six identify both these areas to be of crucial importance as suppliers of fresh fruit and vegetables to the Dar es Salaam markets (see Figure 8.1). The method of survey is also described in detail in Chapter Three and the questionnaire form is contained in Appendix 3.2.

This questionnaire survey was carried out in Swahili by a Tanzanian field assistant in July 1989. The assistant translated the responses in preparation for analysis. A total of 271 interviews was carried out. The method of sample selection is discussed in Chapter Three. The response of the farmers was, in general, favourable, although in Mgeta the assistant reported a greater reluctance to co-operate, in spite of the assistance of the village government, which had to be sought in each village the study involved. On investigation the reason for the problems in Mgeta seems to have been that some farmers had already been interviewed by researchers in separate studies not long before. This appears to have resulted in a 'research fatigue', where the farmers had become tired of giving up time to take part in interviews, in which they see no direct benefits for them personally. The author met two other researchers working in this area at the same time, while he was carrying out his own field work.

This problem was reduced, to some extent, by enlisting the aid of the village and divisional agricultural extension officers, who knew the farmers and quickly helped to gain their co-operation. The extension officers were also able to assist the author in some initial interpretation of the results and, as will be seen, were able to serve as a check on some of the responses given.

Figure 8.1 The Rural Study Areas; a Location Map



The mean age of the head of the fruit and vegetable producing household is 44.9, although the ages given range from 20 years to 87 (Table 8.1). The modal age was 30, accounting for about 7.5 per cent of the respondents. This indicates that the head of household, who in most cases is the male, and who will carry out the negotiating for the sale of the household's produce, is a relatively experienced farmer. Only 15 per cent of the sample is under 30 years old.

The mean level of schooling is just over five years, which is one year longer than the minimum of four years primary education. 43.5 per cent of the respondents who indicated they had attended school have had four years of schooling, while 38.7 per cent have had seven years or more. The result is that over 65 per cent of the total sample have received four years or more of primary level education. Bearing in mind that universal primary school education was only introduced in the 1970s, this is a very high level of education relative to the national population.

Table 8.1 Summary Table of Socio-economic Variables

Variable	Minimum	Mean	Maximum
Age	20	44.9	87
No. of Years Schooling	0	5.4	8
Household Size	1	7.3	20
No. of Children	0	3.0	9
Farm Size	0.3 Ha.	3.2 Ha.	30.0 Ha.
No. of Plots	1	3.4	20
No. of Crops Produced	1	4.8	9

Source: Author's Survey

The overall mean household size is 7.3 persons. The most frequent size indicated was a household of eight people, which accounted for 30 households or just over 11 per cent of the total sample. The mean number of children (defined here as those under 12 years old) in each household is 3.0, which is also the mode, accounting for 21.4 per cent of the total sample. There are frequently problems with the reporting of child data in the African context. Paul (1988) reported that the 'average family' in Mgeta Division comprises six people, four of whom are children. If the data for children reported in the sample is collated with the data representing household size, the children reported account for 34.8 per cent of the total number of members of households reported. In Lushoto District Sender and Smith (1990) reported that children in the 0 to 14 year age group accounted for 51 per cent of the district population, compared with 47 per cent for rural Tanzania as a whole. This suggests that the sample under-represents both the household size and the number of children in each household. This is an important factor for consideration of agricultural production, as Paul (1988) reported that 57 per cent of the households in Mgeta had sufficient family labour to run their farm, while in Lushoto Sender and Smith (1990) identify links between school absenteeism and child labour, particularly among the poorer households,.who cannot afford to hire labour.

The mean farm size is 3.2 hectares, with a maximum of 30.0 hectares and a minimum of 0.3 hectares. There were twenty-four cases of missing data, all of whom were farmers who were reluctant or unable to estimate the size of their farm. In some cases the only way to establish the size of the farm was for the farmer to describe it, and the field assistant to estimate the size based on the farmer's description. The farm which was 30.0 hectares is an exception, being located in Soni village and the only farm which produces fruit and vegetables under contract. According to Paul (1988) and Taube (1988) the mean farm sizes in Mgeta and Lushoto respectively are between 2 and 3 hectares, suggesting that the fruit and vegetable producers have larger farms than general agricultural producers in the study areas.

Most farmers have their farms split into plots of varying land quality and at varying distances from the household. The mean number of plots in this survey is 3.4, with a minimum of 1 and a maximum of 20. The modal number of plots is 3 accounting for 27.5 per cent of the total sample. Those respondents with 2 or 3 plots of land account for over 50 per cent. Only 12 per cent of the respondents had farms of more than 5 plots. Paul (1988) report that the mean number of plots in Mgeta is about 4 and Taube (1988) that most producers have between 4 and 6 plots. This suggests that there is a slightly lower degree of fragmentation among the respondents of the current survey than in general.

In terms of the number of crops grown, the farmers interviewed are more diverse, with the mean number of crops being grown for sale 4.8, a maximum of 9, and only 5 respondents growing one crop. The modal number of crops is 4, accounting for 21.5 per cent of the total sample. The sample is spread to a far greater extent, with 20 per cent growing 7 or more crops and only 7.4 per cent (25 respondents) reported to be growing 2 or fewer crops.

150 respondents, or over half the sample, specified no form of employment as an alternative to farming, and as a means of obtaining additional income. There were a total of 26 different types of alternative employment indicated (Appendix 8.1). These have been divided into four grouped categories and they are listed in Table 8.2.

Table 8.2 Employment Groupings

Employment Type	Frequency	Per Cent
Commercial	67	55.4
Trade/Craft	32	26.4
Professional/Administrative	14	11.6
Other	8	6.6
Survey Total	121	100.0

The professional/administrative category is mainly people employed in the public sector, such as teachers, levy collectors, or extension officers. The commercial sector are mainly involved in running private businesses, such as trading, or providing local services such as producing local beers, running a hotel or a shop. The 'Trade/Craft' sector accounts for those selling a practical skill as a service, such as carpentry, bicycle maintenance, or plumbing. Finally, the other category accounts for a small number of occupations which do not easily fit into the previous definitions.

It is clear from Table 8.2 that the commercial category is the most important of the grouped activities, accounting for more than 55 per cent. The most important responses within this grouped category were 'business', which was the overall modal individual response, accounting for 20.7 per cent of the employed respondents, and the less vague 'small petty business', which accounted for 12.4 per cent of the employed respondents (see Appendix 8.1). Most other grouped categories account for up to five different types of employment, however 'carpentry' stands out as dominating the 'Trade/Craft' grouped category, accounting for 16 out of the 150 employed respondents, or 13.2 per cent.

When the respondents were pressed for a more accurate description of their 'business' or 'small petty business' their responses became even more vague, or they simply refused to elaborate. Some 3 per cent of the employed respondents indicate that their employment is 'business (market)'. Reports from interviews suggest that a significant proportion of the 'business' and 'small petty business' respondents, together with the 'business (market)' respondents, accounting for a combined 39.7 per cent of the employed respondents (17.7 per cent of the overall sample), are involved in the trading of agricultural produce. The interviews with the traders in Lushoto District suggest that these traders may trade their own produce, but more frequently use it to add to the produce they have bought from other producers, in order to assemble a load that would be large enough to make hiring a lorry viable.

However, the involvement in petty trading at all levels of rural Tanzanian life make an accurate estimate of the proportion involved in fruit and vegetable trading impossible. Indeed, in some cases, petty trading may be overlooked, as it is frequently perceived as such a natural part of the way of life, and so respondents may not consider it as important. The above proportion can therefore only be taken as an estimate of those producers frequently involved in this type of trading, as opposed to those who take part in trading on an occasional basis, as a means of partly covering the cost of a long journey. This form of creative use of resources and conservation of transport was encouraged by some party officials in the economically crippling years of the early eighties. The call was issued for those who were travelling with a vehicle to make sure that all available space on their vehicle was being used in order reduce the country's fuel demand, which was rapidly using up the country's meagre foreign currency reserves.

8.2 Comparisons and Contrasts between Lushoto and Morogoro

8.2.1 Socio-economic profile

This section will examine the differences between the two areas where the interviews took place, Lushoto District of Tanga Region and Morogoro Rural District of Morogoro Region. A description of the two areas is given in Chapter Three, so this section will concentrate on the differences which are highlighted by the results of the questionnaire survey.

Table 8.3 Summary Table of the Chi Square Tests with the Study Area Location

Var. 1	x	Variable 2	Chi square	degrees of freedom	Significance	Reject H_0
Area	x	Age Group	16.810	5	0.0049	
	x	Household Size	3.453	3	0.3269	
	x	No. of Children	2.337	2	0.3108	
	x	Level of Schooling	1.242	1	0.2651	
	x	Employment	0.146	1	0.7022	
	x	Employment Type	4.938	4	0.2937	
	x	Farm Size	0.500	3	0.9190	
	x	No. of Plots	14.682	4	0.0054	
	x	No. of Crops	1.307	2	0.5202	
	x	Crop Type	71.046	4	0.0000	x
	x	Crop Selection Motivation	0.226	3	0.9732	
	x	Access to Credit	1.474	1	0.2247	
	x	Purpose of Credit	50.018	4	0.0000	
	x	Source of Credit	4.726	2	0.0942	
	x	Credit Use Frequency.	19.207	4	0.0007	x
	x	Access to Mkt Info	139.403	1	0.0023	x
	x	Source of Mkt Info	11.765	3	0.0082	

† Because of the dominance of one or two values, this test was invalid.

Table 8.3 is a summary of chi square tests carried out on the variables, resulting from the questionnaire survey, by the survey area in which the interviews took place. This table shows that only four chi square values are statistically significant. These are for the type of crop, the purpose to which credit is put, the frequency of credit use, and, finally, the respondents' access to market information. There were no significant chi square results for the socio-economic variables already discussed, indicating no significant differences between the two areas. This section will examine these four variables in more detail using the contingency tabes used to calculate the chi square values.

8.2.2 Crop Type

56 different crops were reported to be grown by the respondents. The respondents were asked to rank their crops according to their importance to their farm. 33 different crops were reported to be most important by the respondents. The crop which was most frequently selected as most important was cabbage, accounting for 20.7 per cent of the survey alone. This was closely followed by tomatoes, accounting for 18.5 per cent. A list of the most important crops appears as Appendix 8.2, but the crops were grouped into crop type categories, as shown in Table 8.4.

The most important type of crop, grown by the respondents in this survey is cooking vegetables, which includes such crops as onions, cabbage and cauliflower, accounting for 31.4 per cent of the sample, the majority of which are cabbages (see Appendix 8.2). Salad vegetables (such as tomatoes, lettuce and cucumber) and fruit (such as bananas, oranges, and lemons) are almost of equal importance, accounting for just over 20 per cent each of the overall sample. Staples (such as cassava, Irish potatoes and sweet potatoes) and pulses are relatively less important, accounting for only 17.6 and 9.0 per cent respectively of the most respondents' most important marketable crops. Staple foods are considered to be the most important food crops grown in both the producing areas visited (SECAP, 1988; Paul, 1988), and nationally (Ministry of Agriculture, 1988). The low status given to them by respondents in this questionnaire may partly be the result of its stated aim of examining the production and selling of fruit and vegetables, but interviews with extension workers suggest that the staples are grown mainly for subsistence crop purposes.

In Lushoto, for example, the main staple consumed is maize, however this crop matures relatively slowly in upland areas, where the climates are cooler and slow the growing period of most crops. In highland areas of the District it can take nine months to produce a maize harvest because of the cooler climate (Cliffe *et al*, 1975). However, on the hotter, drier plain, near Mombo (Figure 8.1), it is possible, with irrigation, to produce a maize harvest in only three months. Clearly, there is a strong argument for farmers in the higher altitudes of Lushoto to produce fruit and vegetables for cash, and to use some of the cash to buy the cheaper maize produced on the plain. Extension officers reported that they have a policy of advocating that the lower slopes of the valleys be freed for the production of crops which are more suited to their environments, such as vegetables. Occasionally, the producer may use some of the farm area to produce staples to supplement the household diet or to save cash which then can be allocated to other purchases. The fruit and vegetable crops take the form of cash crops, which are mainly grown for sale, whereas the staples are mainly grown for home consumption.

Table 8.4 Chi Square of Crop Type by Study Area

Count *Expected Value*	Salad Vegetables	Cooking Vegetables	Fruit	Staples	Pulses	Row Totals
Morogoro	0 *16.0*	21 *23.8*	35 *15.8*	0 *6.8*	20 *13.4*	76 29.8%
Lushoto	54 *37.8*	59 *56.1*	18 *37.3*	23 *16.1*	25 *31.5*	179 70.2%
Column Percent	54 21.2%	80 31.4%	53 20.8%	23 9.0%	45 17.6%	255 100.0%

Degrees of Freedom 4
Chi Square 71.046
Significance 0.0000

No salad vegetables or staples appear as the most important crop type in Morogoro. Cooking vegetables follow the expected frequencies relatively closely. Pulses and especially

fruit are more frequent in Morogoro than expected, accounting for 46.0 per cent and 26.3 per cent of the Morogoro sample respectively, and both at frequencies considerably higher than can be expected if randomly distributed. Salad vegetables and staples are very frequently referred to in this context in Lushoto, accounting for 30.2 per cent and 12.8 per cent of the Lushoto sample respectively, but at much higher frequencies than expected.

It is more likely that this distribution is a function of a variation between the villages selected for survey rather than a difference between the two survey areas. However, the high levels of initial capital investment required to grow salad vegetables, and the differing levels of economic development in each of the areas, described in Chapter Three, suggest that the economic infrastructure may not be sufficient to maintain such costly investments. in Mgeta. It may also be related to the channelling of resources for the production of this type of crop into a very large project already underway in nearby Manolo Valley, which is better suited to the irrigated growing of such crops .

8.2.3 Market Information

There is a significant difference in the access producers have to advance market information in each of the study areas. Table 8.5 is a crosstabulation of these two variables and produces a significant chi square result. `All the respondents were asked if they had access to market information before negotiating their sales with the traders (see Appendix 3.2). All the producers in Morogoro responded to this question in the negative, whereas in Lushoto 78.0 per cent of the respondents indicated that they did have some information in advance of the sales transaction. One of the differences in the relationship between the producers and the traders in each of the areas is that the traders in Mgeta appear to be almost exclusively based in Mgeta. Indeed, the Waluguru tribe, based in the mountains where Mgeta is located, have a long established reputation of trading between Dar es Salaam and its interior (Gordon, 1988). As has been reported, there are suspicions that the traders in Mgeta are conspiring to keep the producer prices low. In Lushoto, there is a significant number of traders who travel to the District to obtain food. The more open market in Lushoto, therefore, may reflect the prices reported in Dar es Salaam more accurately, than the allegedly closed market in Mgeta. This may mean that the producers in Lushoto feel that any reports they receive from whatever source are more credible, whereas those in Mgeta were reported to feel far more isolated from the market of Dar es Salaam.

Table 8.5 Chi Square Test of Access to Market Information by Study Area

Count *Expected Value*	Yes	No	Row Total
Morogoro	0 *45.5*	85 *39.5*	85 31.4%
Lushoto	145 *99.9*	41 *86.5*	186 68.6%
Column Percent	145 53.5%	126 46.5%	271 100.0%

Degrees of Freedom	1
Chi Square	139.4025
Significance	0.0023

The crosstabulation in Table 8.6 indicates the access producers have to market information according to their study area. Again this produces a significant chi square result indicating a significant difference between the two areas in the sources of their information. The main part of this difference lies in two values. Firstly, Lushoto tends to favour to a greater extent than expected the trader as a source of market information. Secondly, in Morogoro there is a greater than expected frequency of indicating that rumour was the main source of market information. The Kin/Friends and Other categories follow the expected frequencies relatively closely.

Table 8.6 Chi Square of Access to Market Information by the Information Source

Count *Expected Value*	Trader	Kin/ Friend	Rumour	Other	Row Total
Morogoro	41 *46.3*	3 *3.1*	7 *2.6*	7 *6.0*	58 *18.6%*
Lushoto	121 *115.7*	8 *7.9*	2 *6.4*	14 *15.0*	145 *71.4%*
Column Percent	162 *79.8%*	11 *5.4%*	9 *4.4%*	21 *10.3%*	255 100.0%

Degrees of Freedom	3
Chi Square	11.7653
Significance	0.0082

The explanation for the differences may lie more in the differences between the individual villages surveyed in each of these areas. Both Mgeta and Matombo can be considered relatively isolated, since it takes a relatively long journey by difficult roads to reach both villages. By comparison, the road to Lushoto from the main road between Tanga and Arusha, has recently been upgraded and renewed. This has resulted in greatly enhanced transport and communication between the villages of Lushoto District and the outside world.

8.2.4 Decision Making Factors

Table 8.7 displays a chi square of the purpose to which credit is put by the two areas of study. This cross-tabulation shows a very clear distinction between the priorities of credit use within the two study areas. The largest observed frequency produced is for the use of credit to hire labour in Morogoro. The expected frequency is 6 and the observed count is 17 or 65.4 per

cent of the Morogoro respondents of this question, or 18.7 per cent overall. By contrast only respondents in Lushoto used credit for the purchase of seeds and food, accounting for 15.4 and 13.8 per cent of the Lushoto respondents. Almost all of the respondents who used credit to purchase inputs were in Lushoto (36 out of 65) accounting for 55.4 per cent of the Lushoto respondents or 39.6 per cent of the overall sample. There is some preference for putting credit to the cost of transport and the purchase of implements in Morogoro, with almost twice the expected frequency in this cell, or 26.9 per cent of Morogoro respondents.

Table 8.7 Chi Square of Purpose of Credit by Study Area

Count *Expected Value*	Buying Seeds	Buying Food	Transport & Implements	Buying Inputs	Labour	Row Total
Morogoro	0 *2.9*	0 *2.6*	7 *3.7*	2 *10.9*	17 *6.0*	26 28.9%
Lushoto	10 *7.1*	9 *6.4*	6 *9.3*	36 *27.1*	*4* *15.0*	65 71.4%
Column Percent	10 11.0%	9 9.9%	13 14.3%	38 41.8%	21 23.1%	91 100.0%

Degrees of Freedom 4
Chi Square 50.018
Significance 0.0000

Clearly a difference in priorities exists between the use of credit in the two study areas. Lushoto respondents concentrate their credit power on purchases of seeds, inputs and food, while the Morogoro respondents concentrate on obtaining labour and transport and implements. This confirms the opinion of extension officers in Lushoto, that the purchase of material inputs for agricultural production, such as fertiliser or fungicides, is severely hampered by infrequent and insufficient supply through official channels. The result of this is that producers have to purchase from unofficial informal market sources at much higher prices. The purchase of inputs is particularly important for the salad vegetable crops, such as tomatoes, lettuce and cucumber, which require much more inputs than traditional, more resilient crops, such as staples or pulses..

The geographic variation in crop selection between the two survey areas may be explained by the influence of the growing conditions of the villages selected for the survey, which vary according to altitude, among other factors, in each village, and also by historical influences. However, the cross-tabulation of the study area by the reasons given for selecting their most important crop did not produce a significant chi square result (see Table 8.3). There is, therefore, no significant statistical difference between the grouped decision motivations reported in the two study areas.

Individual crop choice motivations (Appendix 8.3), rather than the grouped motivations, may be of greater significance to the producers' decisions. For example, in Lushoto, the British colonial government ordered a very large number of fruit trees to be planted, producing temperate fruits which would cater for the increasing expatriate population. The population

never expanded fast enough to consume the supply, and most have now departed, leaving a very large number of fruit trees, particularly pear trees, to produce with minimal care and attention. The market for pears in Tanzania is very small, indeed there were some reports in interviews of pears being sold at very low prices simply because there is not sufficient demand for the quantity which are produced. The pear trees continue to produce with minimal care, although the quality is low. It has been estimated that Lushoto District produces 100,000 tonnes of pears every year. Of this 100,000 tonnes, it is estimated that the district can consume or sell 20 per cent, while the rest are left on the trees to fall off and later rot on the ground. Some farmers are reported to be cutting the pear trees down in order to use the land for more productive uses, from which they will gain direct benefit.

8.3 Comparisons and Contrasts Between The Survey Villages

8.3.1 Crop Types

Because the data is distributed over a larger number of categories when compared with the villages, it proved more difficult tocalculate meaningful chi square tests. Some of these contingency tables are therefore discussed as they stand. Perhaps the most important distinction for the purposes of this research is the differing crop types which are produced in the villages. The contingency table (Table 8.8) demonstrates clearly the differences between the villages. Each village concentrates on one or perhaps two types of crop at the expense of the other crop types. This is particularly clearly demonstrated in the case of Matombo, where almost all (26 out of 34) the farmers there have indicated that a fruit is their most important crop. The remainder are pulse producers. Apart from Matombo there is a clear pattern of each village having about half of their respondents involved in producing one type of crop, while the other half are divided among the other crop types. For example, in Lukozi just under half of the farmers favour cooking vegetables, while in Lwandai half of the farmers favour salad vegetables. The villages vary in their specialism and also in the degree to which they have become specialised in one crop type. The specialisation is likely to be strongly influenced by the growing conditions which exist in each of the villages, which vary and suit different crops. The degree of specialisation may also be interpreted as an indication of the level of outside influence, which has penetrated the areas studied, where producers have been able to capitalise on crops in demand which they can produce.

This pattern suggests a high degree of specialisation has developed among the producers of the villages visited. This appears to be particularly strong in Mgeta and Matombo, where there are no farmers who produce staple or salad vegetables as their most important crop. This specialisation, when examined together with other environmental influences, results in a number of other related variables, such as the motivation priorities of the producers or the growing conditions of their farm.

Table 8.8 Chi Square of Crop Type by Village

Count *Expected Value*	Salad Vegetables	Cooking Vegetables	Fruit	Staples	Pulses	Row Total
Matombo	0 *8.0*	0 *11.9*	30 *7.9*	0 *3.4*	8 *6.7*	38 14.9%
Lukozi	8 *9.7*	20 *14.4*	3 *9.6*	10 *4.1*	5 *3.1*	46 18.0%
Lwandai	22 *9.5*	7 *14.1*	4 *9.4*	4 *4.1*	8 *7.9*	45 17.6%
Soni	18 *9.7*	12 *14.4*	5 *9.6*	2 *4.1*	9 *3.1*	46 18.0%
Malindi	6 *3.9*	20 *13.2*	6 *8.7*	7 *3.8*	3 *7.4*	42 16.5%
Mgeta	0 *8.0*	21 *11.3*	5 *7.9*	0 *3.4*	12 *6.7*	38 14.9%
Column Percent	54 21.2%	80 31.4%	53 20.8%	23 9.0%	45 17.6%	255 100.0%

The geographic variation in crop selection can be explained by the influence of the growing conditions in each village, which vary according to altitude, among other factors and also by historical influences. For example, the colonial government imposed fruit tree planting before independence and this has meant that many fruit tree producers in Lushoto have inherited a plantation of fruit trees, which they may not want. In addition to these influences, the contingency table of village location by type of employment (shown in Table 8.9) suggests that the geographic location also is related to the likely employment of the producer. This, in turn, can be linked to age by analysis of variance of age broken down by the employment type, the results of which are shown in Table 8.10.

Table 8.9 Chi Square of Employment Type by Village

Count *Expected Value*	None	Commercial	Trade/ Craft	Professional/ Administrative	Other	Row Total
Matombo	34 *23.2*	5 *10.4*	3 *5.0*	0 *2.2*	0 *1.2*	42 *15.5%*
Lukozi	30 *26.6*	11 *11.9*	3 *5.7*	3 *2.5*	1 *1.4*	48 *17.7%*
Lwandai	27 *27.1*	12 *12.9*	6 *5.8*	1 *2.5*	3 *1.4*	49 *18.1%*
Soni	16 *26.0*	13 *11.6*	13 *5.5*	3 *2.4*	2 *1.4*	47 *17.3%*
Malindi	28 *23.2*	8 *10.4*	4 *5.0*	1 *2.2*	1 *1.2*	42 *15.5*
Mgeta	15 *23.8*	18 *10.6*	3 *5.1*	6 *2.2*	1 *1.3*	43 *15.9%*
Column Percent	150 55.4%	67 24.7%	32 11.8%	14 5.2%	8 3.0%	271 100.0%

The results of this show a statistical difference in the mean ages of producers, who are in different types of employment (Table 8.10). For example, the mean age of producers who are also employed in the Professional/Administrative sector is 39 years, while, by contrast, the mean age in the Trade/Craft sector is 52 years. Correspondingly, 13 out of 32 of those

employed in the Trade/Craft sector are in Soni, the village with the second highest mean age of 49 years. 34 out of 42 respondents in Matombo are in the "not employed" category, which has the second highest mean age of the sectors with 47 years. Matombo has the lowest number of respondents in all the sectors, except trade/craft.

Table 8.10 Analysis of Variance of Age Broken Down by Employment Sector

Employment Sector	Mean	Std. Deviation	No of Cases
Not Employed	47.27	15.64	148
Commercial	40.64	13.04	67
Trade/Craft	52.28	16.82	32
Professional/Administrative	39.00	9.92	13
Other	46.63	8.72	8
Within Groups Total	45.79	14.81	268

F value = 4.621 Significance = 0.001

Matombo and Mgeta differ greatly in the number of their producers who are employed in addition to agricultural production. The chi square in Table 8.9 shows that Mgeta has the lowest proportion of respondents who are not otherwise employed, while Matombo has the highest. In this variable, Lukozi, Lwandai and Malindi, all relatively isolated, in terms of main roads and important administrative or commercial activities are concerned, have more in common with Matombo than Matombo has with Mgeta.

The reasons for this are clearly to do with the relative locations of each of the villages. Mgeta has its divisional headquarters for the local level government, agricultural extension and co-operative society in its village. In addition, the road on which Mgeta is located becomes impassable at higher altitudes, and so Mgeta has become a focus for commercial activities particularly during the rainy season, when lorries transporting produce to their markets have to stop and collect their loads at Mgeta. This is the reason for the location in Mgeta of the wholesale building as well as the administrative and commercial offices mentioned. These important geographic factors in Mgeta, and those already explained in Soni, have contributed to the provision of employment in each of these villages. The comparative isolation of the other villages has meant that the producers there have had to rely much more on the income derived from their production to survive.

8.3.2 Market Information

The crosstabulation of the village location by the access to advance trading information produces a highly significant chi square value (Table 8.11). This appears to be mainly - although not wholly - the result of Matombo and Mgeta, the villages in Morogoro Region, where none

of the respondents indicated that they had access to any trading information. It is not at all clear why this should be the case. It does suggest that the villages surveyed in the Morogoro area have a chronic lack of market information. This will act as a hindrance in this area to the proper functioning of the free market, which exists for the trading of fruit and vegetables. Indeed, this is a situation which can only benefit the traders and certainly acts as a disbenefit to the producers, who are in a very weak bargaining position. One of the extensions officers interviewed expressed frustration that not knowing what crops are in demand in the urban markets means that there is no basis on which he, or anyone else, can calculate what may be considered a fair price for the producers.

Table 8.11 Chi Square of Market Information by Village

Count *Expected Value*	Yes	No	Row Total
Matombo	0 *22.5*	42 *19.5*	42 15.5%
Lukozi	43 *26.2*	5 *22.3*	48 17.7%
Lwandai	36 *26.2*	13 *22.8*	49 18.1%
Soni	31 *25.1*	16 *21.9*	47 17.3%
Malindi	35 *22.5*	7 *19.5*	42 15.5%
Mgeta	0 *23.0*	43 *20.0*	43 15.9%
Column Percent	145 53.5%	126 46.5%	271 100.0%

Degrees of Freedom	5
Chi Square	148.7321
Significance	0.0000

The problem of isolation and lack of independent sources of market information was a particular concern held by the extension officers interviewed in the Mgeta area. The lack of independent market information fostered a suspicion among the farmers and extension officers alike that the traders who bought fruit and vegetables in this area were conspiring against them to obtain more favourable prices for themselves.

Table 8.12 The Source of Market Information by the Village

Count *Expected Value*	Trader	Other	Row/Total
Matombo	24 *24.7*	7 *6.3*	31 15.3%
Lukozi	41 *34.3*	2 *8.6*	43 21.2%
Lwandai	23 *28.7*	13 *7.3*	36 17.7%
Soni	29 *25.5*	3 *6.4*	32 15.8%
Malindi	28 *27.1*	6 *6.8*	34 16.7%
Mgeta	17 *21.5*	10 *5.5*	27 13.3%
Column Percent	162 79.8%	41 20.1%	203 100.0%

Degrees of Freedom	5
Chi Square	19.426
Significance	0.0016

The original contingency table of the sources of market information by village was invalid for chi square purposes, because of the very low frequency of use of any of the possible sources other than the traders themselves. Radio, rumour and kin/friends were therefore included in the 'other' category as a source of market information for the purposes of calculating the chi square value. This appears in Table 8.12. When the sources of information are considered, it is found that the producers in Lushoto, who appear to have a greater level of information, in most cases receive their information from the traders. The only exceptions are in Lwandai, where about one third of the respondents used the 'independent sources', such as kin or friends, the radio, rumour or the original 'other' category which included extension officers or possibly co-operative officials and so on. In the villages of Matombo and Mgeta, where advance information appears to be less available, the producers are more reliant on independent sources. Only two people have indicated their source of information as being the radio, one each of these is in Mgeta and Matombo.

The data concerning the source of the market information have been cross-tabulated in Table 8.13 by the producers' most important crop type. This table suggests that the crop type produced by the respondent is related to the access the producer has to market information. The chi square test has resulted in a highly significant result. This suggests that if a village as specialised as those involved in this survey, has difficulty in obtaining independent reliable market information, the sector of production the village is involved in will be adversely affected. For example, both Mgeta and Matombo have been shown to have a serious lack of information. Matombo has developed a specialism in the production of fruit, particularly citrus fruit, while in Mgeta the specialism is in the production of cooking vegetables, such as cabbage and, to a lesser extent, pulses. This chronic lack of information will have a detrimental effect on the market for these crops. If producers find that they are having difficulty negotiating a fair price for their produce they may simply opt out of commercial production and choose to produce food for household consumption only.

Table 8.13 Chi Square of Market Information by Crop Type

Count *Expected Value*	Yes	No	Row Total
Salad Vegetables	0 *22.5*	8 *24.4*	54 *21.2%*
Cooking Vegetables	43 *26.2*	28 *36.1*	80 *31.4%*
Fruit	36 *26.2*	46 *23.9*	53 *20.8%*
Staples	31 *25.1*	4 *10.4*	23 *9.0%*
Pulses	35 *22.5*	29 *20.3*	45 *17.6%*
Column Percent	145 53.5%	115 45.1%	255 100.0%

Degrees of Freedom	4
Chi Square	74.4416
Significance	0.0000

8.3.3 Decision Making Factors

The respondents were asked to give a reason for selecting their most important crop. The responses varied greatly, but it was possible to group them into 25 different answers. The modal motivation for growing the most important crop, indicated by the respondents, was 'to obtain cash' (see Appendix 8.3). This accounts for one hundred respondents or 38.5 per cent of the sample. The importance of the crops as a cash earner is reinforced by additional similar motivations such as 'it is my major source of income', accounting for 5.8 per cent of the sample.

These twenty-five motivations have been divided into four broad motivations: economic, such as for its high or consistent price, geographic, such as the crop is suited to the areas; ecologic, such as the crop's short growing season; and social or cultural, such as the land was inherited with the trees already planted, or the crop is grown mainly for domestic purposes, such as during the Muslim fasting period of Ramadan. The results of this comparison have then been compared with the type of crop selected as the most important by the respondents. This is presented in Table 8.14. The economic motivation for selecting a crop, has been given priority over the other main themes mentioned by the respondents, with 59.6 per cent indicating this type of reason as their most important for selecting their most important crop. However, the producers are clearly aware of the importance of the ecology of their District. A significant proportion of the respondents (18.4 per cent) opted for their most important crops because of ecological reasons, such as the crop was best suited for the growing environment, or the crop was resistant to adverse environmental conditions, such as drought. This concern is likely to have arisen from the high population density and the long term concern over the environmental impact of such a high population density in the west Usambaras (Cliffe *et al*, 1975).

The results show that these motivations and the type of crop are related. For example, the salad and cooking vegetables have been selected primarily for economic reasons. Ecological and social or cultural reasons have some importance in the selection of a cooking vegetable, while a low, but higher than expected frequency of geographic motivations also exists behind some decisions concerning salad vegetables. Although the greatest proportion of fruit producers gave an economic motivation for deciding to grow fruit, the count was nevertheless lower than the expected frequency. The count exceeds the expected frequency in social and cultural reasons. This may be the result of two different, but not entirely unrelated, influences. Firstly, there are a number of producers who have inherited land with the fruit trees already growing on them. Most producers have left the trees to continue producing. In Matombo where the production of citrus fruits is very important to the local economy the trees are a valuable asset in any inherited land and are looked after with care.

Table 8.14 Chi Square of Decision Motivation of Credit by Crop Type

Count *Expected Value*	Economic	Geographic	Ecologic	Social/ Cultural	Row Total
Salad Vegetables	39 *31.6*	8 *4.9*	5 *9.8*	1 *6.8*	53 21.2%
Cooking Vegetables	50 *47.1*	9 *7.3*	16 *14.5*	4 *10.1*	79 31.6%
Fruit	26 *31.6*	3 *4.9*	8 *9.8*	16 *6.8*	53 21.2%
Staples	15 *13.1*	2 *2.0*	4 *4.0*	1 *2.8*	22 8.8%
Pulses	19 *25.6*	1 *4.0*	13 *7.9*	10 *5.5*	43 17.2%
Column Percent	149 59.6%	23 9.2%	46 18.4%	32 12.8%	250 100.0%

Degrees of Freedom	12
Chi Square	42.2790
Significance	0.0000

The staple foods, according to Table 8.14, follow the expected frequency relatively closely suggesting that their distribution is little affected by the motivations. The pulses are similar, but are slightly more affected by the social and cultural motivations. This table may be interpreted as reflecting the level of economic awareness related to different crops. Either a high level of economic awareness is required to decide to grow the vegetable crops, or those growing vegetable crops have developed a higher level of economic understanding. The former seems the more likely where the producer is operating on a small scale, and is reliant on a small number of crops to provide sufficient income for the household. Where the producer is operating on a larger scale, it is more likely that diversification is possible and thus the producer can invest in less certain crops, while at the same time producing sufficient quantities of crops already known to give good and reliable returns.

The economic priorities of the producers can perhaps be interpreted by the purpose to which those who had access to credit, used it. Table 8.15 is a cross-tabulation of the purpose for which credit is obtained by the village location of the producer. The number of respondents for this question is low, and so the categories of buying seeds and buying inputs were combined, as were the categories of buying food and labour, to allow easier interpretation. The high number of low expected frequencies precludes a chi square test. This contingency table indicates that, for example in Matombo the most important purpose for which credit is obtained is for the supply of labour. This can be interpreted as the main cost of production in the village. The main crop is fruit and, therefore, the harvest time will require a very large amount of labour for the task of picking fruit from the trees.

Table 8.15 Contingency Table of Purpose of Credit by Village

Count *Expected Value*	Buying Seeds & Inputs	Transport & Implements	Food & Labour	Row Total
Matombo	1 *8.5*	2 *2.3*	13 *5.3*	16 17.6%
Lukozi	12 *6.8*	1 *1.9*	0 *4.3*	13 14.3%
Lwandai	9 *9.5*	1 *2.6*	8 *6.0*	18 19.8%
Soni	19 *12.1*	2 *3.3*	2 *7.6*	23 25.3%
Malindi	6 *5.8*	2 *1.6*	3 *3.6*	11 12.1%
Mgeta	1 *5.3*	5 *1.4*	4 *3.3*	10 11.0%
Count Total	48 51.8%	13 14.3%	30 33.0%	91 100.0%

In Lukozi, where the main crops are cooking vegetables and staple foods, the major purpose for credit is the purchase of agricultural inputs. In Lwandai, where the main crops are salad vegetables, the priorities are split between the purchase of food and the purchase of seeds. In Soni, where the main crop is also salad vegetables, 16 out of 23 respondents indicate that the main purpose to which credit is put is also the purchase of seeds. In Malindi and Mgeta, which have the lowest number of respondents in this variable, the producers responses are spread thinly across the different purposes, the highest values occurring in the purchase of seeds category in Malindi and in the the provisions of transport and implements in Mgeta. This suggests that the crop type is an important factor which influences the credit spending priorities of the producers. However, when it is tested directly, a chi square value of 2.016, which, with 4 degrees of freedom, is not significant at even the p=0.1 level.

There are, however, other factors which appear to have influence on the use of credit by the respondents. The village with the highest incidence of credit use is Soni. Although there was found to be no significant relationship between the use of credit and the village location, this is perhaps significant, as it is perhaps the closest of all the villages to a road of national importance and is located on the main route from Lushoto District to this trunk road. This makes Soni's geographic location commercially highly advantageous and is perhaps the reason why so many producers involved in the 'Trade/Craft' sector are able to find work. In addition, it is well located for the supply of agricultural produce since lorries do not have to travel further into Lushoto's Usambara Mountains, where the other survey villages are located, in order to find the required temperate growing conditions for the salad vegetables which Soni produces. This is reinforced by the fact that the only farmer interviewed, who was producing for contract, was found in Soni.

8.4 Survey of Crop Sales

In addition to the agricultural details, the questionnaire survey of farmers obtained details of producers' estimated normal crop sales. Details of a total of 1,248 transactions were collected. The table below shows that the greatest overall number of transactions reported was in Soni.

Table 8.16 Farmer Transaction Details by Village

Village	Transactions	(%)	Farmers	(%)	Ratio
Matombo	222	(17.8)	41	(15.3)	5.4
Mgeta	136	(10.9)	42	(15.7)	3.2
Morogoro	*358*	*(28.7)*	*83*	*(31.0)*	*4.3*
Lukozi	199	(15.9)	48	(17.9)	4.1
Lwandai	231	(18.5)	49	(18.3)	4.7
Soni	308	(24.7)	47	(17.5)	6.6
Malindi	152	(12.2)	41	(15.3)	3.7
Lushoto	*890*	*71.3*	*185*	*(69.0)*	*4.8*
Total	1,248	(100.0)	268	(100.0)	4.7

The results in Table 8.16, namely the producer-transaction ratios and the proportion of the overall transactions accounted for by those recorded in Soni, reinforces a previous argument stating that Soni has a far more commercially developed village economy. Its high ratio of producer transactions (6.6) also points to a high level of crop diversification within the village in comparison with the other villages surveyed. It is also interesting to note that the mean ratios for both regions are very similar. Both villages which are closest to the main roads to Dar es Salaam, Matombo in Morogoro and Soni in Lushoto have the highest ratios reported, and this further confirms that the higher level of commercial activity is largely a result of the influence of the village's location. On the contrary, Malindi, which is some distance into the Usambara Mountains, and Mgeta, which also requires a difficult and sometimes hazardous drive from the main road, have lower levels of producer-transaction ratios.

The details of the crop sales required the farmers to list up to nine crops which they produced and sold. These crops were ranked by the producers in order of importance. This gave the crop types which the farmers considered as most important, which have already been referred to. However, a far greater amount of different crops are produced and sold in the areas mentioned. In total, 52 different crops were reported. These have been grouped in the same way as the most important crop type category used earlier, and are presented Table 8.17.

When all the transactions are aggregated in this way, without weighting for importance, fruit plays a far greater role than previously indicated. In Table 8.17, fruit accounts for 33.8 per cent of the transactions reported, and makes up the single most important component of all food sales reported. Cooking vegetables follow with 25.3 per cent. None of the other food categories achieve a greater proportion overall than about 16 per cent. Matombo has the

highest number of fruit transactions with 134 or 63.8 per cent of the total transactions in Matombo, and is the only village where the observed frequency exceeds the expected frequency for the number of fruit sales. In Matombo the relative importance of the other commodities is low, except in the case of pulses, which seem to be a secondary food type. Pulses account for 26.7 per cent of reported sales, most of which are to a co-operative. In Mgeta pulse sales account for 40.5 per cent. Clearly, pulses are important to the economy in the villages in Morogoro.

Table 8.17 Cross-Tabulation of Crop Transactions according to Crop Type by Village.

Count *Expected Value*	Salad Vegetables	Cooking Vegetables	Fruit	Staples	Pulses	Row Total
Matombo	6 *33.8*	14 *53.2*	134 *71.1*	0 *19.6*	56 *32.3*	210 *17.7%*
Lukozi	38 *31.4*	58 *49.4*	48 *66.0*	35 *18.2*	16 *30.0*	195 *16.4%*
Lwandai	56 *34.9*	59 *55.0*	61 *73.4*	21 *20.3*	20 *44.7*	217 *18.3%*
Soni	56 *46.6*	78 *73.5*	96 *98.1*	32 *27.1*	28 *44.7*	290 *24.4%*
Malindi	21 *23.3*	46 *36.7*	45 *49.1*	23 *13.5*	10 *22.3*	145 *12.2%*
Mgeta	14 *21.1*	46 *33.2*	18 *44.3*	0 *12.2*	53 *20.2*	131 *11.0%*
Column Percent	191 16.1%	301 25.3%	402 33.8	111 9.3%	183 15.4%	1188 100.0%

Degrees of Freedom	20
Chi Square	308.9916
Significance	0.0000

The importance of cooking vegetables in Lukozi, Malindi and Mgeta is reinforced, and their importance in Soni is greatly enhanced, when compared against the cross-tabulation of producers' most important crop with the village in which they are interviewed (Table 8.14). When the the producers' most important crops are compared against their village location, Soni's producers appear to favour the production of salad vegetables over that of any of the other crop types. In Table 8.17, taking the producers' other crop choices makes this distinction less clear. It does, however, suggest that producers in Soni are more diverse than their counterparts in other villages, particularly among fruit and vegetable types. The number of transactions in Soni village is far higher than elsewhere, and they account for 24.4 per cent of the total number of transactions recorded in the whole survey.

Soni stands out from the other villages, along with its near neighbour Lwandai, in their high proportion of sales to consumers. Table 8.18 shows that when the respondents' buyers are categorised, consumers and traders each constitute just over 60 per cent of the producers' buyers. This figure rises to 84.3 per cent in the case of Lwandai, and to 84.7 per cent in that of Soni. The lowest proportion of transactions reported selling directly to consumers were in Matombo and Lukozi, where they accounted for 43.9 per cent and 32.3 per cent respectively. These two villages, however, have a greater contact with alternative buyers, such as a co-

operative in Matombo which buys pulses from producers there, in 18.6 per cent of the recorded transactions. In Lukozi, on the other hand, 36.9 per cent of transactions involve sales to buyers in retail markets in Dar es Salaam, entered in the 'other' category.

Table 8.18 Aggregated Crosstabulation of Crop Buyers per Transaction by Village

Transactions Count *Row per cent*	Consumers	Traders	Government Agency	Co-operative	Other	Row Total
Matombo	97 *43.9*	123 55.7	3 *1.4*	41 *18.6*	3 *1.4*	221 17.9%
Lukozi	63 *32.3*	112 *57.4*	0 *0.0*	0 *0.0*	72 *36.9*	195 15.8%
Lwandai	194 *84.3*	143 *62.2*	0 *0.0*	0 *0.0*	0 *0.0*	230 18.6%
Soni	261 *84.7*	197 *64.0*	0 *0.0*	0 *0.0*	11 *3.6*	308 24.9%
Malindi	77 *52.0*	109 *73.6*	1 *0.7*	0 *0.0*	11 *7.4*	148 12.0%
Mgeta	78 *57.4*	88 *64.7*	1 *0.7*	0 *0.0*	5 *3.7*	136 11.0%
Column Percent	770 62.2%	772 62.4%	5 0.4	41 *3.3*	136 10.9%	1238 100.0%

NOTE: The table above is an aggregated crosstabulation of the frequency of all the references made to the relevant crop buyer type by each of the respondents in their reporting of crop sales transactions. Most producers reported transactions involving more than one buyer each. The result is that the row percentages do not add up to exactly one hundred, since they refer to the proportion of *producers* who report sales to each type of buyer and not the proportion of transactions reported.

Producers in the other two villages in the survey, namely Malindi and Mgeta, concentrated mainly on sales to traders and consumers, as in the cases of Lwandai and Soni. In both of these villages approximately 84.5 per cent of producers reported sales to traders. Most other producers reported significant proportions of their sales took place with traders, but their sales are a little more balanced, for example in the case of Malindi 52.0 per cent of producers reported sales to consumers and 73.6 per cent reported sales to traders, and in Mgeta 57.4 per cent to consumers and 64.7 per cent to traders. These latter two villages are located at similar time distances from main national roads, Malindi is approximately 50 km from the main Tanga-Moshi highway, which takes about one and a half hours by lorry, while Mgeta is located at about 20 km from the Morogoro-Iringa highway, which also takes about one and a half hours because of the extremely poor condition of the road. Soni and Lwandai, on the other hand, are relatively close to national trunk roads, both about half an hour's drive from the national highway (see Figure 8.1).

The location where the reported transactions take place is also related to the village origin of the producer. For example, Lukozi has the highest proportion of transactions which take place at the farm (52.1 per cent). It also has the lowest proportion of sales which take place in its own village (29.1 per cent), and the highest proportion of sales taking place in Kariakoo market in Dar es Salaam (35.7 per cent). It seems most likely that the lack of a well-established market

in Lukozi has forced producers either to deal with traders who come to seek out purchases at their farm, or to take their produce themselves to Kariakoo in order to sell.

Producers in Soni are very fortunate in having one of Lushoto District's largest periodic markets in their village. This is reflected in Soni having the second highest proportion of producers selling their produce in their own village. The reason for this seems likely to be that the market attracts a high level of demand on market days, and means that producers do not have to travel to get a price they are happy with. This demonstrates the importance of the periodic market to the wholesale trade in fruit and vegetables to the producers of Soni, and suggests that such a focussed buying market can have benefits for the producers.

Mgeta also has an important market which serves to focus the wholesale buying activities in the village and results in a high proportion of the producers being able to sell within their own village. In Mgeta the market takes the form of a purpose-built market building for wholesale trading activities, with space available for bulking of lorry loads, providing facilities which attract traders and the producers wishing to sell to them. The market building is particularly important during the rainy season when most of the villages around Mgeta are inaccessible to vehicles and Mgeta becomes a central focus for the buying and selling of produce.

Table 8.19 Cross-Tabulation of Crop Buyers by Study Area

Count *Expected Value*	Consumers	Traders	Government Agency/Co-op	Other	Row Total
Morogoro	170 *218.2*	142 *99.7*	40 *11.8*	5 *26.2*	357 28.8%
Lushoto	589 *540.8*	205 *247.3*	1 *29.2*	86 *64.8*	885 71.3%
Column Percent	759 61.1%	347 27.9%	42 3.3%	91 7.3%	1242 100.0%

Degrees of Freedom	3
Chi Square	158.556
Significance	0.0000

The broader pattern of the disaggregated Morogoro data displays a more balanced proportion of traders and consumers buying from the respondents (Table 8.19). In Morogoro there are 47.6 per cent of transactions reported with consumers buying and 39.8 per cent with traders buying. In Lushoto, however, there are 66.2 per cent of consumers buying in the reported transactions and 23.2 per cent of traders. This suggests a more externally oriented production economy in the Morogoro area, while in Lushoto a greater proportion of the reported transactions take place directly with consumers, suggesting a more highly developed local demand.

Table 8.20 presents the data on the location of the transactions reported by the respondents, crosstabulated with the study area. A greater number of transactions than expected took place

in the 'at farm' and 'other village' categories in Lushoto, accounting for 15.9 and 10.4 per cent of reported Lushoto transactions respectively, while in Morogoro the producers' village (accounting for 59.1 per cent of Morogoro transactions), or Kariakoo and the 'other' category account for a greater number of sales than the expected frequency. There are a low number of sales taking place at the farm and in other villages in Morogoro, while in Lushoto there are more sales taking place in other villages around the area, reflecting again perhaps the more highly developed demand in and around Lushoto. In both cases almost 20 per cent of the sales are reported to take place in Kariakoo. The proportion of sales taking place in the Lushoto area (in the 'this village', 'other village' and 'at farm'categories) as opposed to in the urban area, in other words, at Kariakoo and the 'other' category (mainly consisting of informal Dar es Salaam sales), result in a ratio of 79.7% to 20.2%. The equivalent calculation for Morogoro results in a ratio of 68.9% to 32.1%. This may be result of Lushoto's location at a greater distance from Dar es Salaam by comparison with the Morogoro (see Figure 8.1). It may also be explained by the strong trading ties between the Waluguru, the tribe inhabiting the Mgeta area, and the trading of food in Morogoro town and Dar es Salaam, discussed earlier, encouraging a greater number of producers in Morogoro to attempt to trade out of the area themselves, rather than sell to a middleman.

Table 8.20 Cross-Tabulation of Location of Sales by Study Area

Count *Expected Value*	At Farm	Nearest Village	Other Village	Kariakoo	Other	Row Total
Morogoro	27 *48.3*	201 *193.7*	18 *31.6*	66 *63.2*	45 *20.1*	357 28.7%
Lushoto	141 *119.7*	473 *480.3*	92 *78.4*	154 *156.8*	25 *49.9*	885 71.3%
Column Percent	168 13.5%	674 54.3%	110 8.9%	220 17.7%	70 5.6%	1242 100.0%

Degrees of Freedom 4
Chi Square 65.129
Significance 0.0000

There is little difference between the two areas in terms of the numbers of crops the producers sell, since a chi square of the number of crops grown (grouped into three categories) and the area did not produce a significant chi square result. However, Table 8.21 displays a contingency table of the number of crops against the crop type in the sales transactions. This has produced a highly significant chi square result. This shows that there is statistical relationship between these two variables. More specifically crops such as the salad vegetables and the cooking vegetables appear to involve a greater degree of specialisation, with a high proportion and a higher than expected frequency of producers selling these crops, concentrating on a small number of crops. In the case of fruits, however, the secondary place they have in most producers' priorities is in part confirmed by the higher numbers of types of crops farmers selling them are producing and selling. Both staples and pulses have observed frequencies higher than expected in the lower crop numbers and in the higher ones. This

perhaps reflects two different motivations for producing staples for sale. Firstly, there is the producer who is concentrating on the staple or pulse as the main cash crop, this is the producer concentrating on the small number of crops. Secondly, there is the producer who is producing staples and pulses for domestic use, but often produces more than the household requires. These he or she then sells, but these crops are secondary to the main purpose of the farmers' production.

Table 8.21 Chi Square of the Main Crop Type by the Grouped Number of Crops Produced

Count *Expected Value*	1-3 Crops	4-6 Crops	7+ Crops	Row Total
Salad Vegetables	138 *116.9*	43 *59.0*	9 *14.1*	190 16.1%
Cooking Vegetables	215 *184.5*	68 *93.1*	17 *22.3*	300 25.4%
Fruit	175 *246.0*	188 *124.2*	37 *29.8*	400 33.8%
Staples	77 *67.7*	20 *34.2*	13 *8.2*	110 9.3%
Pulses	122 *111.9*	48 *56.5*	12 *13.5*	182 15.4%
Column Percent	727 61.5%	367 31.0%	88 7.4%	1182 100.0%

Degrees of Freedom	8
Chi Square	90.5066
Significance	0.0000

The crop types types have also been found to be statistically related to the people to whom they are sold. Table 8.22 is a crosstabulation of the main crop types sold by the respondents and the categories of buyers to whom they sell. In order to make the table valid for a chi square test, the Government Agency and Co-operative categories have been amalgamated. This table demonstrates that, on the whole, salad vegetables, cooking vegetables and staples conform to the expected frequencies for sales to the consumer and the traders, but they exceed the expected frequencies for the sales to 'other' buyers, mainly made up of non-Kariakoo urban wholesale market traders in Dar es Salaam. Fruit, on the other hand, exceeds expected frequencies of sales to traders and consumers, but is lower than expected in sales to 'other' buyers. Finally, although pulses are mainly sold to consumers, this is lower than the expected frequency. A higher than expected frequency in pulse sales occurs with co-operative buyers, pulses being the only crop which respondents to this questionnaire sell to co-operatives. This is also already known to only happen in Matombo.

The higher than expected frequencies of sales of vegetables to informal urban wholesalers demonstrate the level of informal marketing which exists between the survey villages and the urban market. 9.9 per cent and 11.0 per cent of sales of salad vegetables and cooking vegetables are producers selling to the 'other' category, which are mainly urban traders. This is relatively small, but does not include the proportion of sales which take place between the rural trader and the urban trader. In addition, this does not take into account the *volume* of sales

since this is only a record of the *number* of sales in which the respondents are regularly involved. The proportion of sales which are channelled first through the rural-buying traders is greater and amounts to a total of 28.9 per cent of all commodity sales (31.2 per cent of fruit and vegetable sales alone). Since producer-to-trader sales always involve far greater volumes than those involving producer-consumer transactions, this represents a far greater proportion of the *volume* of sales which take place. As a result of this survey, it is possible to estimate that 24.1 per cent of salad vegetables, 23.0 per cent of cooking vegetables and 14.4 per cent of fruit sales transactions, carried out by the respondents, took place in Kariakoo. The smaller proportion of fruit sales in Kariakoo gives a further confirmation of the argument in Chapter Five that the balance of the crops that arrive at Kariakoo favours vegetables over fruit.

Table 8.22 Aggregated Cross-Tabulation of Crop Buyers by Crop Types

Count *Expected Value*	Consumers	Traders	Governmen Agency/- Co-op	Other	Row Total
Salad Vegetables	114 *114.2*	57 *55.4*	1 *6.6*	19 *14.7*	191 16.2%
Cooking Vegetables	175 *179.4*	92 *87.1*	0 *10.4*	33 *23.1*	301 25.5%
Fruit	254 *238.7*	129 *115.8*	0 *13.8*	16 *30.7*	400 33.8%
Staples	70 *65.8*	27 *31.9*	0 *3.8*	13 *8.5*	111 9.3%
Pulses	94 *108.9*	38 *52.8*	40 *6.3*	10 *14.0*	183 15.4%
Column Percent	707 59.8%	343 29.0%	41 3.5%	91 7.7%	1182 100.0%

Degrees of Freedom	12
Chi Square	238.863
Significance	0.0000

8.5 Summary

In conclusion, the average farming household is headed by a farmer of about 45 years, who has about 5 years of primary schooling. The farm size is of about 3.2 hectares, divided over 3 plots of land, on which the farm will be growing between 4 and 5 crops intended for commercial sale. The household will have just over seven members, only 3 of whom will be under 12 years of age. The household size is likely to be higher in Lushoto District as a result of the frequency of the practice of polygamy in these areas.

The producer is less likely to have formal employment, in addition to the farm, so the farm forms the main part of the household income. Those who do have employment are most likely to be involved in informal market trading, although there is a very wide variety of other forms of employment farmers are involved in. The main crop is most likely to be a cooking vegetable and least likely to be a staple or pulse, although most producers grow these for subsistence. The producer is less likely to have access to credit, while those who do are unlikely to have access to large quantities, the majority using less than TShs 5,000. Most farmers rely on the

trader to whom they sell to get a fair price, as they appear to have little independent information on prices and demand in the main consuming areas.

The flows of information are almost entirely dominated by the traders of fruit and vegetables who buy from the producers and who clearly have a vested interest in the information which reaches the producers. Other independent sources of information, such as relatives or friends, who travel to the urban markets are less regularly available and are certainly not as frequently used. If producers are to obtain realistic prices for their produce they must have access to and use independent market information. This is already provided on a limited basis by the weekly radio broadcasts of Kariakoo Wholesale Market prices and delivery reports. In addition, the Sunday News began a column reporting similar information in April 1989. This type of information must be encouraged and more widely used.

There is a high demand for modest amounts of credit for agricultural purposes on an annual basis. The nature of the frequency of demand suggests that it is linked to the crop growing seasons, and may therefore not occur at the same time for every household, but will depend on the type of crop being produced. The demand is already being met to a limited extent, but there clearly remains a high unsatisfied demand. Much of the credit supply is provided by the traders who also buy from the producers (28.0 per cent), or from kin (41.0 per cent). In addition, the purposes for which the credit is required in the two study areas is relatively similar to the national data obtained from the Co-operative Rural Development Bank.

Despite the historical and environmental differences between the two study areas, there is little to distinguish them in terms of the responses given to the questionnaire. Three out of the four significant differences may be explained by the village differences rather than the study area differences. However, the clearest distinctions are in the use of credit, Morogoro respondents using credit more for agriculture-related services, such as, for hiring labour, while Lushoto respondents purchase agricultural inputs.

A greater number of distinguishing variables exist between the villages. Matombo has the highest mean age with 57 years, while Lwandai has the lowest at 39 years. The other villages remain between 42 and 49 years on average. There is greater significance in the difference between the mean ages of producers broken down into crop types which they produce. Fruit, which is an important crop for Matombo, has producers of the highest mean age of 54 years, while salad vegetables, the most important crop type for Lwandai, has producers of mean age of 38 years. This may be partly because older farmers still have the fruit trees they were told to plant by the colonial government, or that fruit trees require less labour to produce.

Market information is also an important distinguishing variable, with none of the respondents in either of the Morogoro villages receiving market information. Very few respondents use independent information sources such as radio, newspapers or relatives who may live in urban

areas. The evidence suggests none of the information supplied by such sources would be considered as relevant to the rural sales negotiations. The wholesale purchasers buying in the rural producing areas are in a strong bargaining position.

The evidence from the questionnaires suggests that the motivations for growing certain crops varies between the type crops the producers grow. For example, salad and cooking vegetable producers can be described as more economically motivated, while those producing pulses may have more ecological, or social or cultural motivations. The pulse producer is likely to be concerned to conserve the soil or to produce for the household consumption. On the other hand, the salad vegetable producer is more likely to do so in order to earn cash or maximise the farm's financial returns.

The study areas and, more significantly, the villages, are distinguished by their 'farmer-crop transaction ratio'. Soni, in Lushoto District stands out, with a ratio of 6.6 transactions per producer, indicating a village of highly diversified producers. By contrast, the ratio of 3.2 in Mgeta suggests a lower level of diversification, but is more likely to be the result of the high level of population pressure and land shortage in Mgeta Division, where producers are limited in the land available to them for production. As a result there is very little space in which to grow a large number of crops, and there have been frequent legal conflicts between farmers (Paul, 1988).

Fruit production is less important on a village or study area scale, particularly when the main crops are concentrated on, but a large proportion of households reported producing fruit for sale. The reason fruit is important is that it is a secondary crop produced widely in Lushoto because of the large number of fruit trees in the area, where as in Matombo most producers concentrate on producing citrus fruit for sale. Fruit is likely to be secondary to the main household production in Lushoto District, especially in villages such as Soni. Fruit trees require little attention to produce, although the results may be of low quality.

Producers are happy to sell to either producers or direct to consumers - each reported as buyers by about 62 per cent of the respondents. The consumers are likely to involve small sales made at the periodic markets, where socialising function, exchange of information, and local news are likely to be more important than economic returns.

Chapter Nine

Discussion

9.1 Review of Methods

The supply of food to the urban population of Africa is an issue of immense importance to African governments. As the cities of Africa continue to increase in size at alarming rates, the question of how to meet the spiralling food requirements of its urban populations becomes increasingly complex. This study attempts to redress the curious imbalance of research on African urban centres, which has tended to focus more on issues of physical infrastructure, such as spatial layout, provision of shelter and in-migration. This study attempts to fill the gap, contributing an analysis of the provision of fresh fruit and vegetables for the urban market of Dar es Salaam.

The study employed a variety of both primary and secondary data sets and a wide range of techniques of data capture in order to cover the range of interests and groups involved in fruit and vegetable marketing. These are as follows: the analysis of formal wholesale market price and volume data recorded in Kariakoo Wholesale Market; a survey of urban retailers; a survey of Lushoto traders; price data recorded by the Marketing Development Bureau; a survey of rural traders; and a survey of rural producers.

The Kariakoo data provided an extremely useful indication of changes in the formal sector supply of fruit and vegetables. They revealed a number of long term trends and indicated seasonal patterns of supply to Kariakoo, which are likely to reflect patterns for the city itself. However, one of the main difficulties of these data is that they are only an estimate, although a reliable estimate, of what passes through Kariakoo. There are no data collected for wholesale transactions outside Kariakoo market. The survey of urban retailers collected data concerning trading which occurs in the informal sector, in an attempt to overcome this. A second difficulty concerns the accuracy of the Kariakoo data. As has already been reported, there were difficulties in eliciting a consistent formula for volume conversions from KMC staff. Producers and traders entering the market measure volume in local units, such as baskets or large sacks. However, on entry to the market these volumes are converted into metric tonnes by tally clerks, who appear to estimate the conversion based simply on experience, since the facilities for weighing produce are limited. In addition, the calculation of the value is based on this estimated volume multiplied by the minimum 'guideline' price, which is frequently ignored by the dealers on the trading floor. Despite these difficulties, clear patterns were produced which correspond with the qualitative data collected through interviews and other studies.

The survey of urban retailers is based on a relatively small sample of a population, the size of which can only be estimated. This survey had to focus on the most visible and easily accessible retailers, those of fixed locations in the urban markets. Sporrek's study (1985) suggests that even at during the mid 1970s street vendors played an important role in the supply of fruit and vegetables to the urban consumers. The observations of the current study would suggest that conditions for street vendors have improved, allowing their numbers to swell around the city, as indeed they have in many other cities in the developing world (Paddison, 1990). This is an area that is the subject of study in South-East Asia (McGee and Yeung, 1977), but it is a subject area of which little is known in Tanzania. So long as unemployment and under-employment exist in Dar es Salaam and illegal trading is accepted, or at least not interfered with by the authorities, it seems reasonable to assume that such informal trading will continue to exist. What is not quantified, however, is the importance of this activity to both the supply of fruit and vegetables and to the employment and survival strategies of the urban dwellers.

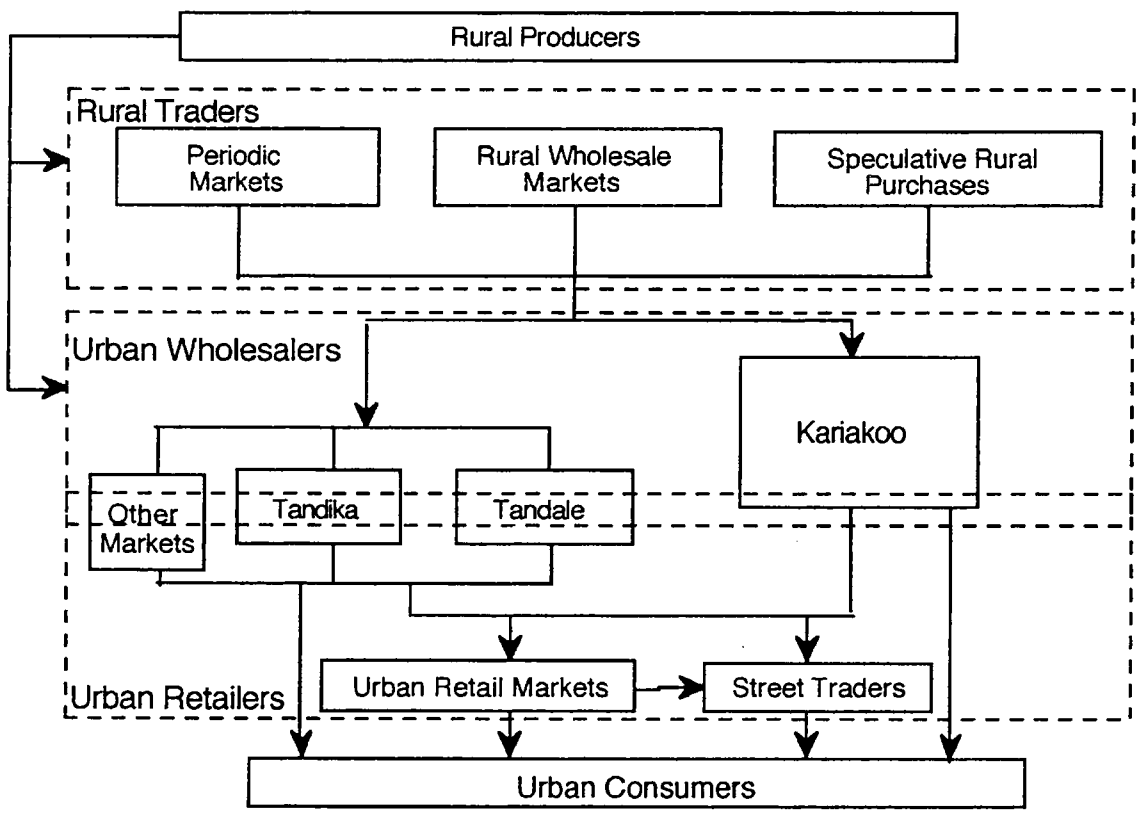
9.2 New Models of Fruit and Vegetable Marketing in Dar es Salaam

At the beginning of this study, a number of approaches to urban food supply were reviewed. Among these, Boekholt and van der Veen (1986), in their study of food supply to Mysore City, produced a model of the supply system (Figure 1.1). This general model can be modified to focus on the role of the markets in the fruit and vegetable supply system for Dar es Salaam (Figure 9.1). This model attempts to show the role of each level of the food supply system. For example, while in Sporrek's model C (Figure 3.7), the wholesale market operates as a centralising institution, Dar es Salaam traders now have a range of wholesale sources from which they can choose. Kariakoo is still an extremely important wholesale market, dealing with approximately 50 per cent of deliveries to the city. However, evidence suggests that the role of the informal sector is of increasing importance. The markets of Tandika and Tandale (see Figure 3.1) were frequently referred to as important sources of vegetables and, more importantly, fruit. The evidence suggests that the volume of turnover of supplies to the city will increase almost threefold, from the time of the fieldwork to the year 2000. Kariakoo's volume of turnover has not increased since 1983, because it simply cannot handle any more deliveries. Unless new market premises are found, the formal sector will still account for 70,000 metric tonnes per year, when the city consumes 500,000 metric tonnes in the year 2000, thus reducing the formal sector's share of wholesaling to 14 per cent. Without continuing liberalisation of the economy, it is clear that the formal wholesaling of fruit and vegetables, to meet the demand of the rapidly expanding urban population, would be inadequate.

The evidence collected from interviews and observations in the city indicate that Kariakoo is currently competing with other market locations for wholesaling business. This is reflected in Figure 9.1 which shows Kariakoo as one of a number of urban wholesaling markets. The size of

each of the markets reflects their relative importance. The other two markets named in the model, Tandale and Tandika, have both retail and informal wholesale functions. Kariakoo has advantages, such as its capacity and subsequent large numbers of buyers, security for overnight storage and reliability for the buyer, in terms of stock and variety of produce. Disadvantages include: extreme congestion, both inside and outside the market building, which limits pedestrian and vehicle access, commission charges, and licensing fees. As opposed to open air markets, the atmosphere in Kariakoo wholesale market is unpleasant because of a lack of ventilation or air conditioning, coupled with high temperatures and humidity and the pervasive smell of rotting food. The retail market places have advantages such as their proximity to the main residential areas and their distance from the traffic congestion of the city centre. These markets are also retail markets and so provide a demand among the retailers, and a relatively rapid channel for disposing of produce. The wholesale trading in these markets avoid the commission rate which is charged at Kariakoo, although KMC is known to be sending clerks to attempt to extract commission from these informal trading channels.

Figure 9.1 Model of Market Relationships in the System of Fruit and Vegetable Supply for Dar es Salaam



The model in Figure 9.1 begins with rural producers, who have a range of channels open to them for selling their produce. Most rural areas have a well-developed periodic marketing system for the exchange of goods and services, which are of economic and social significance to the rural population. These relate directly to Maliyamkono and Bagachwa's (1990) 'traditional' market channel and comprise well-developed market systems rotating around a hierarchy of

several market centres in a similar pattern to that described by the central place theorists discussed in chapter 1. These periodic occasions, taking place about once or twice a week, have proved ideal for rural and urban based traders to meet rural producers, and negotiate the purchase of food commodities for transporting to the urban markets. In some areas the production of food for the urban market is of such importance that a wholesale market building has been constructed to facilitate the marketing process. For example, the wholesale market building in Mgeta forms the focus for the trading of produce from the surrounding area. This is particularly important during the rainy season when the villages on the road beyond the market building are inaccessible by lorry on the main road through the area. Commodities produced at higher altitudes have to be carried down to the market, where traders wait to purchase. A final channel comprises itinerant traders travelling out from the city to those areas known to produce the commodities sought. This type of trader travels around a rural area negotiating the purchase of producers' commodities. Once he has sufficient volume to fill a truck, he hires the truck usually from the nearest town or village and collects the produce from the producers. In some cases this type of trader may also arrange the hire of labour to harvest the farmers' produce, although this appears to be common practice only in tree crop producing areas, such as the plains of Tanga Region, where citrus fruits, mangoes and coconuts are grown. For example, it is common practice around Muheza in Tanga Region for traders to hire a producer's field of orange trees at a rate based on the number of trees in the field. The trader will then hire labour to harvest the crop, and load it onto his lorry to take to Dar es Salaam (Seminar für Landwirtschaftliche Entwicklung, 1986). This has the advantage to the farmer of not requiring him to make a large capital outlay to pay for harvesting, one of the most expensive parts of agricultural production. It has the advantage to the trader that it increases his margin, because he can obtain a lower price from the producer.

Each of these three 'inter-regional' market channels transport produce to the city and may feed into two main channels on entering the city. The evidence from this study suggests that those traders entering the city with vegetables are likely to go to the official market, Kariakoo. Vegetables, being generally less perishable than fruit, are better suited for Kariakoo's strengths, such as overnight storage and a large number of buyers, particularly institution buyers making large purchases. On the other hand, traders bringing fruit into the urban areas are more likely to avoid the official market and go direct to a retail market. The two retail markets named in the model, Tandika and Tandale, are large retail markets which have also developed as reputable informal wholesale markets for fruits, especially citrus. The result is that street traders and retailers from the city's retail markets go to these two markets, as well as Kariakoo, in search of wholesale fruits. The box in the model entitled "other retail markets" represents an additional, less important channel, where a trader, or producer, entering Dar es Salaam takes his produce to a retail market to sell direct to retailers. This has resulted in some of the smaller, more recently established retail markets obtaining a reputation as wholesale sources of certain commodities, with street traders and retailers from markets nearby

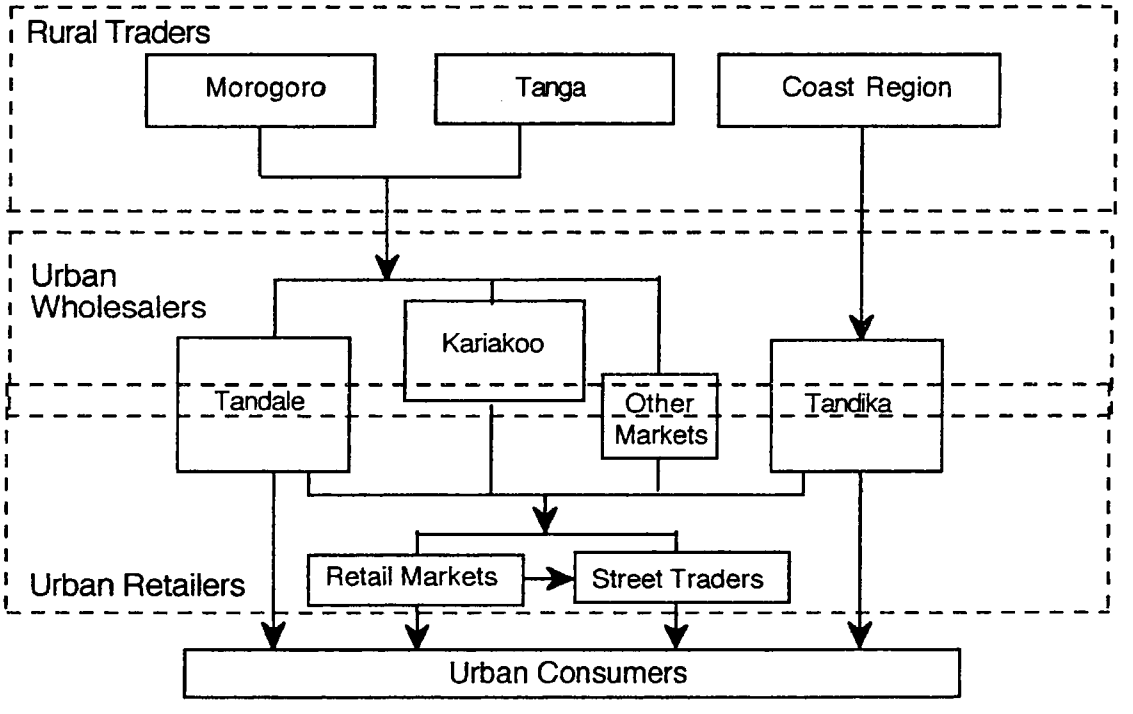
occasionally coming to those markets instead of the better established markets. These minor wholesale markets have tended to specialise in certain commodities; for example, Ubungo market on Morogoro Road has become well-known as a source of different types of bananas, while Buguruni market on Nelson Mandela Avenue has become known as a good source of citrus fruits, particularly oranges. The final level of the system, before the produce reaches the consumers, comprises the retail markets and the street traders. For the purposes of the retailers' survey carried out as part of this study, the retail markets were defined as markets maintained by the city council. However, Sporrek (1985) points out that the distinction between a group of individual street stalls and a market place is not quite so clearly distinguishable. Many of the city council run retail markets referred to in this study began as small groups of individual stalls. However the market place retailers tend to have a greater level of capital to invest. This is clear because in order to trade in the main retail markets, a trader must pay a licence fee and a stall rent. By contrast the street traders generally deal in smaller quantities, in some cases they can be seen in the street selling oranges, for example, out of the bags (*gunia*) in which they were purchased and carried to the retail point.

Figure 9.2 presents a model focusing on one commodity type. Designed to present the system of supply for citrus fruits, this model shows that the role Kariakoo plays in the system is significantly reduced. The three main regions from which citrus fruit are obtained for Dar es Salaam are Morogoro, mainly from the eastern Uluguru Mountains; Tanga, mainly from Korogwe and Muheza Districts; and Coast Region, from south of the city and from Kisarawe District, to the south west. Without records it is impossible to calculate accurately the actual levels of importance of the citrus wholesale markets. However, qualitative data, such as interviews with Dar es Salaam retailers suggest that the importance of Kariakoo Wholesale Market is being undermined by other markets such as Tandale and Tandika. This is reflected in the size of the boxes representing each of the markets, although the relative sizes are symbolic and not scaled. The physical route by which the fruit is brought into the city determines to a great extent which market is predominantly used for wholesaling the deliveries. For example, citrus supplied from south of the city favours the use of Tandika market, because of its southern location. When fruit from the north or west of the city is in season, Tandale market is favoured because of its location on the Morogoro Road, which enters the city from the west.

During the survey, reports suggested that Buguruni market is becoming increasingly important as a point of entry to the Dar es Salaam marketing system for citrus fruits from Kisarawe. This model shows that Kariakoo, because of its central location, congestion and commission charged, is by-passed in an attempt to distribute these highly perishable commodities rapidly to the retail outlets. Street traders and door-to door sellers are an important element of the marketing of citrus fruits the reason being that the highly perishable nature of citrus fruits makes it necessary to make frequent small purchases. These traders purchase relatively small

quantities of fruit and sell them on street corners to passers-by. Although they sell smaller quantities, they have no overheads, their costs simply being the price of the produce and the cost of the transport, usually a bus fare. Because of the dispersed nature of citrus fruit retailing in the city, the wholesaling system has evolved a relatively dispersed geographical pattern more appropriate to the needs of all the participants. For example, street traders, in an effort to minimise their costs, trade-off lower market prices, which may be available at a more distant market in the city, with lower transport costs, obtained by going to a market which is nearer their retail point. Under these circumstances it may be entirely inappropriate to centralise all Dar es Salaam's fruit wholesaling on one site, as it will have the result of increasing retailers' costs and, ultimately, these will be transferred on to the consumer.

Figure 9.2 Model of Citrus Fruit Supply Channels For Dar es Salaam



By contrast, Figure 9.3 focuses on the vegetable supply system for Dar es Salaam. This model encompasses different areas of the country, and demonstrates that Kariakoo has a far greater degree of prominence for vegetables than for citrus fruits. The producers interviewed in the rural areas, who were mainly vegetable producers, gave far greater significance to Kariakoo as the wholesale market they favour in Dar es Salaam. Analysis of the Kariakoo Wholesale Market data suggests that vegetables have increased in relative importance in the wholesale market during the 1980s. This change is due to Kariakoo's advantages, as discussed previously. Fruit is highly perishable and usually has to be sold and distributed rapidly. The ability to store produce overnight at Kariakoo is unlikely to be perceived as an important advantage by citrus fruit traders, unless refrigeration facilities become available. Most vegetables, on the other hand, are less perishable and, therefore, they can be stored for longer periods, allowing the dealer time to secure an optimum price. Unlike the open air

markets, Kariakoo has loading and unloading facilities for dealing with bulk deliveries arriving on large lorries. These include loading bays and relatively easy access to the trading floor. Its size attracts a large number of buyers, including institutional buyers, who are assured a relatively large selection of commodities. Few vegetables are produced south of the city, making Tandika's role in this model significantly reduced, in contrast to the model for the citrus supply system. Tandale, however, is located on the main route into the city from all of the areas producing vegetables, and is considered among retailers to be a market of considerable and , significantly, increasing importance in the wholesaling of vegetables. In the case of vegetables, therefore, because of their less perishable nature, the pattern of supply is different. The more centralised system of wholesaling appears to suit these commodities. These retailers do not have the same time constraint due to perishability faced by retailers of fruits.

Figure 9.3 Model of Vegetable Marketing Channels Supplying Dar es Salaam

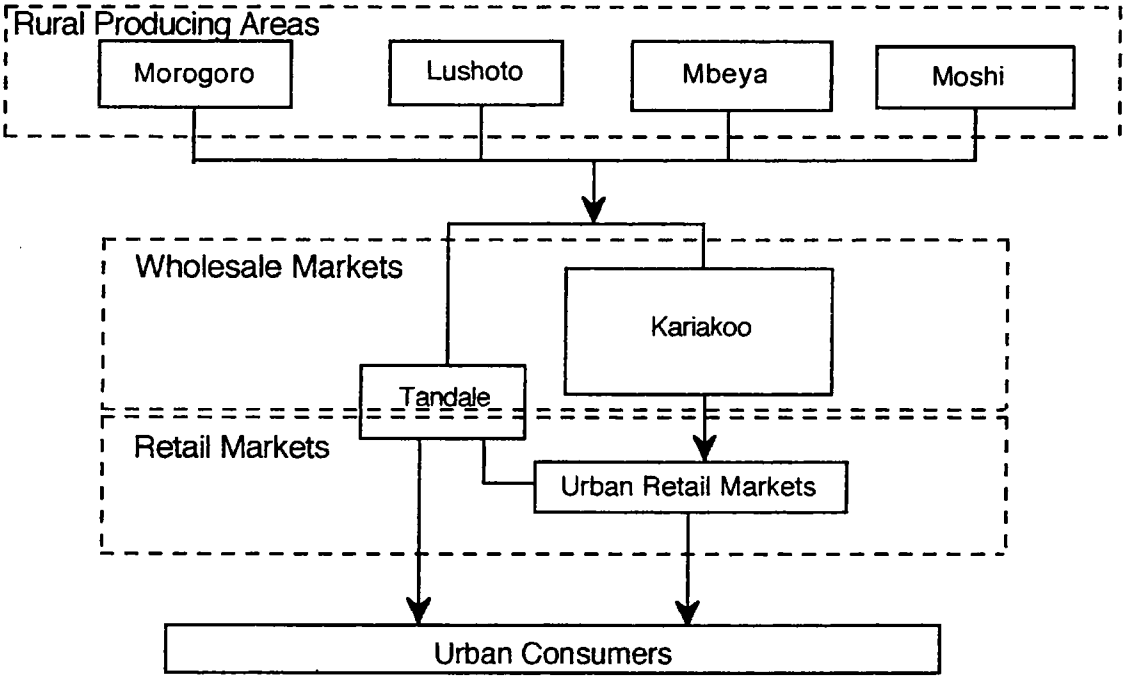
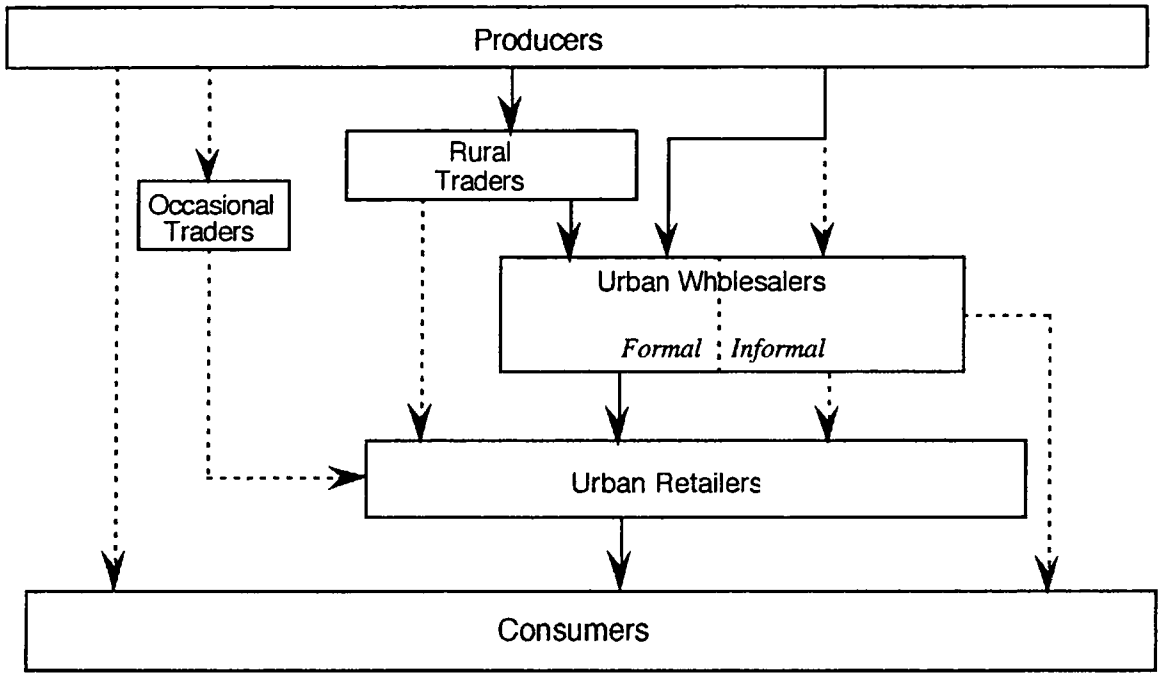


Figure 9.4 presents the system in terms of the relationships of each of the groups involved in the fruit and vegetable supply system. This is a simpler model than Boekholt and van der Veen's model for the urban food supply system for Mysore, because the supply system for fruit and vegetables to Dar es Salaam has no cooperatives, commission agents or government organisations directly involved. The rural producers in their search for buyers may sell legally to rural-based traders or urban-based wholesalers in Kariakoo Wholesale Market. However, it may be more convenient or more profitable for them to sell to informal sector wholesalers, retailers or direct to consumers. The latter strategies reduce the proportion of the retail margins lost to middle agents.

Figure 9.4 Model of Marketing Channels Supplying Dar es Salaam



------- Informal Sector Channels

——— Formal Sector Channels

The rural-based traders can be divided into two broad groups. Firstly, the "occasional" trader, who buys perhaps a sack of a commodity to take on a long journey. This sack will either be sold on arrival at a market in order to defray the cost of transport, or presented to a friend or relative, with whom the traveller may stay, as payment for accommodation. This form of trade falls within Maliyamkono and Bagachwa's (1990) definition of a 'shuttle' marketing channel. The second type of rural trader is involved in trading on a full-time, or almost full-time basis. These traders usually buy sufficient quantities to fill a hired lorry, either alone or jointly with another trader. On entry to the city, the rural trader is obliged to sell produce through the regional trading company, which in Dar es Salaam is the Kariakoo Wholesale Market. The evidence presented in this study suggests that only about half of the wholesaling at this level takes place through the formal marketing channel. This form of trading falls within Maliyamkono and Bagachwa's (1990) 'inter-regional marketing channel. The model in Figure 9.4 distinguishes between the channels which are in the formal sector, in other words, produce which is sold wholesale in Kariakoo and which is then channelled to retail outlets, and those in the informal sector, in other words, produce entering the city marketing system without passing through Kariakoo Wholesale Market. The model shows the alternative channels in the informal sector through which produce is distributed. The most important channels are where produce is sold to informal wholesalers in the main retail markets. For example, this study has presented evidence that a proportion of the produce supplied to Dar es Salaam's market from areas south of the city, enters the city's marketing system through Tandika market. However, some traders sell direct to consumers, and some producers bring their own produce into the city and either sell to retailers or direct to consumers. This latter alternative is only usually an option

where the producer is selling small quantities of highly perishable produce, such as spinach, tangerines or tomatoes. In the case of spinach, producers are located in and around Dar es Salaam and sell the produce to consumers themselves. The highly delicate and perishable nature of this leafy vegetable requires that it is consumed within hours of cutting, therefore a longer and more complicated marketing channel would result in delays to the speedy distribution of the produce.

9.3 Data Analysis and Policy Considerations

One of the main concerns of the retail traders in the urban markets, and many of those who operate outside the main retail markets, is the possibility of being caught if and when the government or the city authorities decide to act on the existing legislation, which makes it strictly illegal to trade without a licence from the city authorities. In addition, by law, all traders should purchase their commodities from Kariakoo wholesale market. These laws have been quietly ignored but could still be enforced. Lado in his discussion of rural marketing systems in West Africa, disagrees with a description of marketing systems as disorganised. He explains that they are however subject to overnment restrictions which may impede or influence their development. He goes on to say that rural marketing systems, in particular, "transmit the impact of macro policy on to farmers' incentives and, therefore, on to production and distribution" (Lado, 1988, p.373). The marketing system, because of its structure, will transmit impacts of effects of the government changes in marketing or production policy both up the channels, to urban marketing and consumption, and down, to rural trading and production. Maliyamkono and Bagachwa (1990) argue that many unworkable government policies established in the late 1970s and early 1980s spawned the expansion of the informal sector. Kariakoo is not capable of handling more than about half of Dar es Salaam's current fruit and vegetable requirement, clearly making the law concerning wholesaling of fruit and vegetables in Dar es Salaam unworkable. Immediate clarification of street and informal sector trading is therefore necessary, in order to provide an atmosphere of security in which traders can operate. A distinction can be made between worthwhile productive informal sector activities and commodity specualtion and racketeering. These proposals are in line with the liberalisation of the other food marketing systems within the context of the continuing changes in the political economy of contemporary Tanzania. In addition, Maliyamkono and Bagachwa argue that far from being irrational, agricultural producers have shown themselves to be highly rational, basing much of their production decisions on security of income. They therefore argue for a stabilising of agricultural policy and realistic pricing to encourage surplus agricultural production (Maliyamkono and Bagachwa, 1990).

The analysis of the data collected from Kariakoo Market Corporation on the price and volumes of the fruit and vegetables traded there over an eight year period, suggests that Kariakoo cannot absorb an increase in volume. This is in spite of the estimated current rate of increase in

Dar es Salaam's population of 4.8 per cent per annum and Kariakoo's role as sole legal wholesaler. Indeed, the market has already exceeded its designed capacity by a factor of two, and has remained at approximately that level of volume during the latter few years of the data series. This would suggest that the increase in the volume of consumption of fruit and vegetables in the city since the mid 1980s has been entirely supplied by the informal sector.

Two reports (Abbott, 1986; Marketing Development Bureau, 1985) suggest a relocation of Kariakoo's marketing activities to a more peripheral site, which has the capacity for expansion to accommodate future needs. These reports also point out that the commission levy is too high and too costly to collect. These conclusions had already been reached by the informal sector, which had already avoided the Kariakoo commission charges altogether by established itself on several peripheral sites around the city. Moreover, the informal sector is more flexible in being able to adapt to seasonal variations in supply. Clearly, for fruit wholesaling, the current informal sector conditions, if not ideal, suit present market conditions. However, the increasing use of Kariakoo as a wholesale market of certain commodities, such as vegetables, suggests that there is still a demand for such a facility. It would seem sensible, therefore, given the limited space available on the Kariakoo site, that an additional vegetable wholesaling site is constructed on a site owned by the KMC located on Nelson Mandela Avenue (see Figure 3.1). Further, since the current low level of success of wholesale levy collections undermines the purpose of the market to provide a centralised fruit and vegetable wholesaling and distribution system, it is perhaps more appropriate to charge for the use of the market facilities. Abbott (1986) suggests a charge on floor space used or on vehicles entering the market. However, this may result in the loss of estimates of market throughput, on which the analysis in Chapter Four of this study is based and which is currently collected in order to calculate the levy. Abbott also suggested that the KMC levy charge of 6 per cent is very high for the wholesalers. Set against this is the high cost of collection in terms of time consuming administration, which reduces the benefit of the levy.

If Kariakoo is to maintain its current proportion of the Dar es Salaam wholesale market (about 50 per cent), the construction of the new market must be able to accommodate an increased volume of goods, estimated to be 250,000 metric tonnes, or 500,000 metric tonnes for the whole city, by the year 2000. This will require an estimated 17,000 square metres of trading floor and the capacity of handling over 1,000 delivery vehicles per day. The evidence presented in this study suggests that Kariakoo must now consider itself to be operating in competition with the other markets carrying out wholesale functions, particularly Tandale and Tandika markets. However, some of the more strategically placed markets are relatively recently established, such as Ubungo (reportedly a good source for bananas) and Buguruni (reported as wholesaling oranges). The importance of these markets as wholesaling markets is likely to increase, mainly due to the advantage of their geographic location in relation to the points of entry to the city for various commodities. The retail markets are also distinguishable

by the consumers for which they cater. One market, Kinondoni, has a much higher level of quality of produce, and, therefore, a higher price is charged for the commodities sold there. This suits the expatriate community and more affluent government employees and business people who live near to this market.

The more perishable fruits such as oranges, tangerines, ripe bananas and tomatoes by-pass Kariakoo in greater proportions than other commodities such as cabbage, onions and Irish potatoes, and some retail markets have already established reputations for wholesaling certain commodities. The general trend of the location of wholesale trading activities is outwards, away from the city centre and towards the city's periphery. Therefore, the peripheral location of a new wholesaling facility would be an asset to the city's wholesale system and would complement the central location of the Kariakoo wholesale market and the more disparate retail markets with wholesaling functions.

A realistic attitude to Kariakoo Market Corporation's role as provider of wholesale facilities must be adopted. This must involve concentration on the market's strengths; for example, it is possible to lock the market overnight, there is a covered trading area, the market attracts buyers of large quantities of produce, and there exist bulk loading and unloading facilities. Kariakoo still attracts a significant proportion of Dar es Salaam's fruit and vegetable produce so the current service could be maintained, but the market's sustainability should be reviewed regularly. The KMC's proposed new wholesale market could still be established on the site already owned by the corporation, farther out of city, if it incorporated sufficient adjacent space for future expansion, for which KMC was negotiating at the time of the survey. One additional important consideration must be taken into account. That is a system by which the produce can be moved from peripheral wholesale market to retail markets must be planned for. The success of the private sector in supplying the transport service to the peripheral retail markets, may prove a useful model from which to plan. This network has been established without the assistance of the formal sector and could feasibly be expected to provide the service for the new wholesale market.

The informal sector, because it involves a large number of small traders is far more flexible than a large monopoly marketing organisation. These traders are able to deal in different commodities, change location, expand or contract their operations as required, without cost to the city or government. Porter (1992) reported that rural production of some luxury fruits as well as livestock and poultry can have high returns if carried out on a small scale, especially if marketed by the producer. When these commodities are produced in greater quantities problems arise because of insufficient market research. The luxury market is severely restricted in Tanzania and the high foreign exchange costs involved in producing high quality luxury fresh foods make it very difficult for this form of production to succeed. For example, agricultural inputs require imported chemicals, irrigation requires pumps, spare parts and fuel and crates

for transportation often require imported steel for nails or staples. The example of spinach production and marketing illustrates this point. The requirement for rapid distribution of this vegetable suits the very simple and short producer-seller marketing channel very well. Any attempt to produce spinach on a large scale would have to carefully consider the constraints of marketing: that the produce must be sold within hours of cutting and that people generally purchase small quantities; constraints of transportation: it is a very delicate leafy vegetable and would have to be handled with immense care, particularly in bulk quantities, in order to avoid it being crushed. Under these circumstances an individual producer-seller, carrying a single basket to market every few days to sell directly to consumers ensures that the produce can be sold rapidly, that it is handled carefully and that its small scale of production and distribution, and direct selling ensures that the producer-seller's costs are minimised.

Retail markets around the city should be prepared to take on the additional role of wholesaling. The organisation of the market administration should take this into account and provide facilities, where possible, to assist. For example, where a market is acknowledged to have a strength in supplying one particular commodity on a wholesale basis, the market administration could become actively involved in promoting this, by attempting to provide suitable facilities for storage, trading, and commodity handling, at the same time receiving income from the wholesale traders, through rents, levies or licence fees, for the use of the facilities. However, this should not be seen by the city authorities as a way of obtaining further income. Retailers interviewed for this study suspected that any money made by levy collection in a market place, over and above running costs were sent to the city authorities. This was not a popular activity, particularly where facilities and space in the market place were lacking. Money made should be reinvested in the market place, in order to streamline the marketing channels in the market place and improve the service to the retailers.

Bucklin (1977), in his review of food retailing in Asian countries, felt that too much emphasis is being placed on improving retailing in developing countries through the application of inappropriate Western solutions. He suggested that the technology that could appropriately be brought to retailing in developing countries was that of market organisation. In other words, marketing channels should be organised and coordinated, both horizontally and vertically, in order to ensure that the retailers were obtaining the type of assistance and infrastructure they felt they required. He gives as examples the increasing the size of individual stalls, increasing the space around retailing areas for the circulation of goods and customers, improving the design of market places to make them places where people would want to go and where they enjoy their experience, where they are bright, well-ventillated, with plenty of provision of facilities for disposing of waste. While most markets do not make sufficient margins to consider some of these ideas, others are certainly worth consideration for improving the effectiveness of the market place. Lado (1988) argues for improved storage and transportation infrastructure, particularly in areas of surplus production, and the effective integration of productive areas into

the national economy, such that more effective broadcasts of market intelligence will be of relevance to producers in rural areas. Maliyamkono and Bagachwa (1990) argue for a closer examination of the 'second economy' before legislation or policy is formulated, in order to ensure the market or producer response desired. They explain that the purpose of the marketing channels are to supply a need and to remunerate the producers of goods. If private traders can provide a challenge to the inefficinecies of the state-managed system then it has a valid role to play in the economy. However, producers and traders can also be supported and influenced by large state-managed agencies who are operating in the market.

By contrast, there is no body of data of fruit and vegetable trading in the rural producing areas, so the analysis of this aspect of the supply of these commodities, relies on a survey of traders in one of the main producing areas. It can be concluded from this survey that the system of purchasing from the producers is extremely flexible and highly varied. It appears to involve large numbers of the population to varying degrees. The involvement ranges from full-time traders, although these are mainly urban based travelling buyers, through part-time farmers, to almost any member of the population who intends to travel to an area where there is a shortage of the commodities produced at home. The bulk of fruit and vegetables, however, appears to be bought by traders, who are either urban-based, or who also produce part-time, but whose main occupation is trading. In Lushoto District, much of the purchasing is focused around the village periodic markets, with certain markets appearing to concentrate on supplying one destination, for example Soni was found to produce mainly for the Tanga market, whereas Lukozi produce tended to go to Dar es Salaam. Other purchasing activities, although less common in Lushoto, included contract farming, pre-arranged sales and speculative purchasing visits to producers by traders.

The greatest difficulties facing traders interviewed for this study were the high cost of transportation and the low level of reliability of the transport services. The main cause is the poor condition of the main roads in Tanzania. If the main routes connecting Dar es Salaam with its hinterland were to be improved, this would remove the greatest constraint experienced by traders involved in transporting food to the city. Improved roads would facilitate the distribution system and remove a considerable proportion of the traders' operating costs and uncertainties. It would also make it easier for producers themselves to travel to the urban markets . This would also have direct benefits for urban consumers, by reducing retail prices, and for producers by opening up areas, from which, at present, it is currently too expensive or too difficult to transport produce. The survey of rural producing areas took place shortly after significant improvements had been made to the Mombo to Lushoto road (see Figure 8.1). The importance of this improvement is still to be assessed, but all those spoken to in the course of the author's fieldwork were very optimistic about its impact. This recommendation is echoed by Porter (1992), suggesting that greater investment in roads would assist producers of food for

urban markets in the Jos Plateau in Nigeria, and also by Chiteji (1980) in a study of the impact of transportation on the Uluguru mountains, in Tanzania.

This study benefitted from the availability of a database of market prices, as reported on a monthly basis throughout Tanzania for a selection of commodities. This database has been analysed to establish a pattern of price variations on an annual and a monthly basis, between Dar es Salaam and its main fruit and vegetable supply areas. This analysis has identified areas with comparative advantages in mean monthly price over the time series, as well as areas that are at a comparative disadvantage. This exercise has identified economic strengths and weaknesses of different geographic areas. However, two considerations must be taken into account. Firstly, these are price data and measure prices only, therefore, they can say nothing about the marketing systems on their own. They require the integration of the analysis of qualitative information, for example regarding the methods of production, trading or transportation, in order to interpret the price and volume data patterns. Secondly, these data are retail prices in the market towns and not farm gate prices, and they therefore are not a direct measurement of trading margins. However, in the absence of any price and volume data regarding fruit and vegetable wholesaling in Dar es Salaam's hinterland, this analysis, integrated with interview methods, observations and literature surveys, yields useful indications for future development potential of the areas examined.

The analysis of the monthly price data provided by the Marketing Development Bureau suggests that certain areas could, in economic terms, have significant potential in the supply of fruit and vegetables to the urban market of Dar es Salaam. The maps produced by this analysis give indications of the most profitable areas from which to supply certain crops to the city at particular times of year. Because this is based on the retail prices of towns in the main supply areas, it is a relatively crude measurement. However, in the absence of any other attempt of this kind it gives an indication of a geographic pattern of supply and of favourable economic marketing conditions. It shows, for example that the real market margins for sweet bananas increased over the period from 1981 to 1988 in almost all of the selected market towns. It suggests that the supply of cabbage is maintained throughout the year by Lushoto, Mbeya and Iringa because they maintain a mean monthly margin of between TShs 15 and TShs 20. This type of model could also be used to assess the viability of targeting other areas as future supply areas. For example, Lindi Region is described by traders and market observers as having increasing importance in the supply of citrus fruits, but it has the potential, from an ecological point of view, to produce additional crops, such as coconuts and mangoes. In order for it to take advantage of this, the road connections must be considerably improved. A price model such as has been developed in this study could be used to test the viability of assisting this area, through the construction of a new road. Finally, if monitored this type of model may help identify areas where the potential for producing certain crops in economic terms has increased or decreased. For example, this analysis showed that the price margins for sweet

bananas in Lushoto were the highest of the six market towns, although Lushoto was not reported as being an important producer of sweet bananas. Lushoto is known to have an environment suited to successful cooking banana production and it may be possible to take advantage of the favourable price margins which have been indicated by this analysis.

The differences between the two selected producing areas examined, namely Lushoto and Morogoro, are negligible, the only distinguishing features being the use of credit and access to market information. Lushoto producers used credit to purchase inputs and had greater access to market information. Morogoro producers used credit to purchase agricultural services, such as labour and transportation, while very few of the Morogoro producers appeared to have access to accurate market information. The survey identified villages which appeared to be more external market oriented, in terms of fruit and vegetables production, than others. The villages concentrated on supplying one urban market. While a significant proportion of producers selected the crops they would grow for economic reasons, these motivations were predominantly to be found among vegetable producers. Producers of other crops gave other types of reasons such as ecological or social and cultural.

The most striking result of the survey of rural producers is the low level of use of market information, and of the stark difference between the two areas studied. The low level of use of market information is perhaps understandable, because it is perceived by many rural producers to be broadcasting the typical prices in the city wholesale market, and may be unrelated to the prices which they can expect to obtain in their area. This is demonstrated by the large regional variations in price recorded by the MDB data in Chapter Seven. These city prices are of little relevance to rural producers. Kariakoo Market Corporation should address the fact that almost none of the producers interviewed paid any attention to their weekly broadcast of commodity deliveries and prices, and instead appeared to rely on traders for their market information. Abbott (1986) recommends that any market news service which is established must ensure it is catering for the needs of the proposed listening population. For example, he suggests that a radio service for farmers be broadcast before 6:30 am and after 7:00 pm, while a service for traders could effectively be broadcast at midday. Therefore, in order for such a broadcast service to be of relevance to the rural producers, it must broadcast the regional prices on a daily basis and at times when the producers are able to listen, otherwise it is of little use. Monitoring the usefulness of a market information service to the target audience is also of crucial significance. The service should be flexible enough to adapt to meet the needs of its audience.

The evidence in the survey suggests that the producers are a relatively highly educated group of the rural population, who are economically motivated. This, however, varies between villages and between the two main areas surveyed. Soni and Matombo appear to be more commercially oriented than other villages, with producers more involved in selling their crops to

the market buyers. This variation appears related to the location of the village in relation to the main routes to the city markets.

One of the main difficulties reported by the producers and reinforced by the extension officers, was that of the difficulty of finding a suitable market. There were frequent reports in both Morogoro and Lushoto of crops having to remain in the fields to rot, because it was not viable to hire labour to harvest and transport to the point of sale. As has already been argued, the improvement of transport links should reduce the costs involved and have the knock-on effect of improving the producers prices. Additionally, the producers reported having difficulty in obtaining inputs, for example seeds, fertilisers, fungicides. The formal market is the main source by which producers are supposed to obtain their supplies of inputs. However, they reported that the supplies were infrequent and inadequate. It is possible to obtain supplies on the informal market, although they tend to be very highly priced.

In spite of the lack of comprehensive data, this study has been able to establish several patterns and trends in the supply of fruit and vegetables to Dar es Salaam. It has described the importance of small scale trading to the rural dwellers as being a widespread practice often used to defray the cost of a journey. However, two main types of full-time fruit and vegetable traders have been distinguished: locally based traders buying from producers at the local periodic market or at a local wholesale market building, or traders from the city who make speculative trips to farms to arrange for the purchase of commodities direct from the farm. The importance of the formal wholesale sector in Dar es Salaam is in decline, because of its inability to expand in line with the increasing demand. However, Kariakoo Wholesale Market still maintains a central role among an increasingly competitive wholesale sector. This may have come about because a more dispersed system of wholesale trading appears to be more appropriate to the requirements of the commodities being sold and to the the benefit of the consumer. For example, the swing to the informal sector has increased the speed with which produce reaches the consumer and reduced the marketing costs. This, in turn, has reduced the commodity prices and increased availability. Many of the retail markets have adopted informal wholesaling functions, taking advantage of their more favourable locations around the city. For example, they are located close to main routes into the city, away from traffic congestion in the city centre and close to the residential areas and the consumers. The channelling of food marketing is different for different commodities. This is demonstrated in the contrast between the citrus and the vegetable marketing models presented.

Chapter Ten

Conclusions

1. Previous research in the supply of fruit and vegetables to urban areas in developing countries has provided some insights into the marketing process. For example, there is a large volume of anthropological material describing the markets, their roles and the participants in detail, but with little analysis of the systems and processes of marketing themselves. Furthermore, this approach lacks an overall focus or, indeed, definition of research priorities. There is also a large volume of literature examining the quantitative aspects of food marketing systems and pricing policies, but fruit and vegetables are not included in this material. The focus tends to be rather on staple grains. This approach concentrates on price changes over time, with little regard to the markets, or the role of market participants or the culture of, and the social milieu in which, the systems are placed. Alternatively, there has developed an analytical approach which regards food marketing as a process of distribution, with an uneven system of entitlement according to the allocation of wealth in the society concerned. However, this approach focuses on the institutional defects of the society and their relative effects on different groups of the population, with little regard to the systems involved. An additional approach to marketing within the geographical literature attempts to explain the establishment of rural marketing systems in terms of established geographical theories of central place and innovation diffusion. Nevertheless, all these approaches have the common element of failing to incorporate the fruit and vegetable sector as a central theme. They also fail to provide a meaningful analysis of change and development of the food marketing over time. This study has adopted a synthesized approach to this problem, examining the food supply system from several different perspectives and using a range of approaches. A detailed examination was undertaken of price and volume data over several years for Kariakoo Wholesale Market, the only legal wholesale market in Dar es Salaam. This demonstrated a rise in the vegetable component of the volume of produce handed at Kariakoo, at the expense of the fruit component. The liberalisation of the Tanzanian economy has encouraged the informal trading of food. This more rapid , small scale and dispersed form of trading is better suited to marketing more perishable fruit commodities. Market margins for commodities between Dar es Salaam and six market towns in the main areas of supply through the 1980s provided a second perspective. This showed that the considerable regional variation in market price margins occur between Dar es Salaam and its fruit and vegetable supply regions. These variations tended to increase during the 1980s and they vary during the course of the year as the changing seasons provide different areas with optimal weather for production. Extensive interview surveys were undertaken, firstly, of producers in two of the main fruit and vegetable producing areas of Tanzania, Morogoro District and Lushoto District, Tanga

Region; secondly, of traders in Lushoto; and, thirdly, of retailers operating in six of Dar es Salaam's main retail markets. A series of in-depth interviews with participants and observers at all levels in the system of supply was also conducted. Rather than concentrating on one group of the population, or on one type of data, at one period in time, this study integrates a wide range of data sources which have been used to construct a comprehensive an analysis of a previously neglected sector of the economy, integrating both qualitative and quantitative data. This study analyses the various data sources emphasising the evolution of the food marketing system in the context of the changing political economy of an African country experiencing IMF-imposed liberalisation. This shows that the official changes in other sectors of the economy have had profound influences on the fruit and vegetable sector. The liberalisation of the grain marketing, for example, has resulted in wholesale grain trading legally taking place in Dar es Salaam's retail markets. This has encouraged confidence in fruit and vegetable wholesalers to continue and expand their still technically illegal businesses. It provides a framework into which aspects of the previous approaches can be integrated. This gives a clearer overall picture of the production and distribution of fruit and vegetables for Dar es Salaam and how this system has developed over the last decade. This study contributes a necessary component in an otherwise 'patchy' field of research, and through the assessment of a food supply system over a period of time, provides an interpretation of its likely future. This latter element is particularly important during present changes in the Tanzanian economy due to political and economic liberalisation since the mid-1980s.

2. The liberalisation of the marketing channels for staple foods, resulting in the open wholesaling of these commodities in various locations around the city of Dar es Salaam, has been successful in encouraging the informal trading of fruit and vegetables especially since the mid-1980s. Kariakoo Wholesale Market nevertheless still remains an important focus for urban marketing channels of fruit and vegetables in Dar es Salaam, despite the changes brought about by economic liberalisation since the mid 1980s. The marketed throughput handled at Kariakoo reached double its designed capacity in the mid 1980s and has stabilised at that level. Indeed, Kariakoo Wholesale Market is currently unable to increase its volume of turnover above 70,000 metric tonnes, due to severe restrictions of space. If Kariakoo Market Corporation is to continue its role of providing facilities for the city's wholesale trading, it must acquire 15,000 square metres of trading space, in addition to the current 2,400 square metres in Kariakoo Wholesale Market. The proportion of turnover of vegetables at Kariakoo Wholesale Market has increased from 36 per cent of all trade in 1981 to almost 60 per cent in 1988. The fruit produce is increasingly channelled through other market centres in Dar es Salaam.

3. The informal wholesaling sector of the peripherally located retail markets now accounts for 50 per cent of fruit and vegetable wholesaling in Dar es Salaam. This is as a result of its capacity to distribute perishable commodities more rapidly than Kariakoo Wholesale

Market. Tandale and Tandika retail markets distinguish themselves from the other retail markets in Dar es Salaam, in that they have developed as important informal wholesale centres. They have the advantage of being flexible, less congested than Kariakoo, being closer to the retail outlets, and because they are unofficial, there is no wholesale levy charged. These markets have developed since the mid 1980s as direct competitors to Kariakoo for wholesale trading, very much reflecting changing market conditions because of liberalisation. Even more recently established, but smaller, markets are developing as wholesaling centres of increasing importance, but with marked commodity specialisation. Tandale specialises in products from west and north of the city, including most fruits and vegetables, but mainly fruits; Tandika specialises in products from the area to the south of Dar es Salaam, such as citrus fruits; Ubungo specialises in bananas; Buguruni in products from Kisarawe, mainly oranges; Mwenge obtains tomatoes, when in season, from around Kunduchi, just north of the city. The type of produce which the informal wholesale markets handle depends more on their location in relation to the main routes entering the city from the producing areas. Tandika is located on Kilwa Road, the main route to Dar es Salaam from the south; Tandale is located on Morogoro Road, the main route to the city from Tanga and Morogoro Regions, where oranges are grown; Ubungo is also located on Morogoro Road; while Buguruni is located on Nelson Mandela Road, near Pugu Road, along which produce coming to the city from Kisarawe arrives.

4. The purchase of commodities in rural areas for re-sale in urban centres is a wide spread practice. Three main rural purchasers can be identified: rural-based traders who purchase from rural producers to transport into the city's markets; traders based in the urban areas may travel out to the producing areas to purchase produce from producers; and people who are travelling may purchase food for sale as a means to subsidise the cost of their journey. Large scale fruit and vegetable traders generally find their suppliers at:-

   (a) periodic rural markets, where the trader can expect to meet a large proportion of the rural population because of the social, cultural and economic importance it has assumed in rural life in many parts of Tanzania. Traders in in this channel tend to be based in the rural area;

   (b) rural wholesale market buildings, which have been established where the cash production is of importance to the area's economy, and are frequently used as meeting points for producers and buyers. Traders in this channel tend to be rural;

   (c) farms, where buyers make a speculative visit to producers. Traders in this channel tend to be urban-based.

The most important single constraint for the entire supply system is the transport infrastructure. This is reflected in high transport costs due to: frequent breakdowns because of the poor condition of the main roads in Tanzania; the poor condition of the

roads makes journeys slow and therefore the fuel requirement is high; and the cost of importing fuel and spare parts is high. An improved transport system, with good, well maintained roads will bring enormous benefits to the transportation of fruit and vegetables, reducing the costs to the trader and ultimately to the consumers.

5. The rural producing areas can be conceptualised as competing to supply the city with fresh fruit and vegetables. However, their environmental circumstances mean that each has the optimal climate to produce certain crops at different times during the year. The result is that the seasonality of the producing areas leads to complementarity, providing an almost year-round supply for the Dar es Salaam market. For example, a mean of about 70 per cent of the supply of tomatoes to Kariakoo in the first four months of the year are from Lushoto and Mbeya. During May to July between 60 and 70 per cent of tomatoes supplied came from Iringa, whilst during August to October between 50 and 65 per cent of tomatoes were supplied from a combination of Morogoro, Ruvu and Mkaiye. In the last two months, Iringa, Lushoto and Mbeya supplied the city in approximately equal proportions. In planning for improved fruit and vegetable provision for the city of Dar es Salaam, therefore, an important factor is the geographic variation in the origins of the different commodities, as they change through the year. The environmental advantages of each area, in terms of soil and seasonal climate, is reflected in a seasonal price pattern for each commodity. For example, there is a clear seasonal variation in the price margin of cabbages in Lushoto, however, its seasonal variation is complemented by those of Iringa and Mbeya at different times of the year.

6. The producers interviewed were relatively highly educated, with clear economic motivations for being involved in cash production. They tended to work larger than average farm sizes, with a lower level of fragmentation of farm plots. Villages varied in both their level of production for market, and the market to which their produce would ultimately be sent. Reasons for this appear to be the location of the Districts' commercial centres and the geographic location of the villages in relation to the main roads running through the area. The closer villages are to the roads in the district, the more convenient they are for traders to visit. For example the villages in Lushoto which are in a position to take best advantage of cash production, such as Soni and Lukozi, are all close to the main road through the district.

7. The importance of this research is threefold: it meets the need for an integrated approach to the main problem of food supply for the urban areas of the developing world; it provides an analysis of fruit and vegetable production and marketing in the developing world in general, and Tanzania in particular, something which much previous research ignores; finally, the comprehensive approach adopted here has demonstrated that the sources of data which are available on fruit and vegetable production and marketing is relatively sparse and previously unconnected. There is need for more and

better quantitative records of prices, particularly in the rural areas, and for the effective communication of this information to traders and producers. For example, farm gate prices, instead of urban market prices, could be collected on a frequent basis, and quickly reported on the radio at times when farmers can listen and before the prices are out of date. Future research, therefore must continue this integrated approach to the problem of food supply, approaching the problem from several perspectives, incorporating a range of data. This is a particularly important in the fruit and vegetable sector, where there is very little data to work with and where consequently research is also lacking.

Appendix 3.1

DEPARTMENT OF GEOGRAPHY
UNIVERSITY OF DAR ES SALAAM

FRUIT AND VEGETABLE TRADERS' SURVEY, DAR ES SALAAM
MARKET DATE /9/89

Trader No.	Sex (m/f)	LENGTH OF TIME AS A TRADER	FRUIT AND VEGETABLES DEALT WITH	FRUIT AND VEGETABLES ONLY? (y/n)	CUSTOMERS 1. Traders here 2.Traders in other markets 3. Consumers 4. Others*	SOURCE 1. Kariakoo 2. DSM* 3.o/s DSM* 4.brought by trader* 5. Other*	TRANSPORT 1. Lorry 2. Pick-up 3. Bus 4. Mkokoteni 5. Train 6.Other*
1	2	3	4	5	6	7	8

* Give details of e.g. area where commodiies bought, if a market, give name, region etc.

Appendix 3.2

UNIVERSITY OF DAR ES SALAAM
DEPARTMENT OF GEOGRAPHY

FRUIT AND VEGETABLE SUPPLY FOR DAR ES SALAAM

FARMER'S SURVEY

1. PERSONAL CHARACTERISTICS

1.1 How old are you? .....

1.2 How many years of schooling have you had? .....

1.3 Do you have another job? If "yes", what?

.....

1.4 How many live in your household? .....

1.5 How many of your household are under twelve years of age? .....

2. PRODUCTION

2.1 What is the size of your farm? (In hectares) .....

2.2 How many land parcels do you have? .....

2.3 How many crops do you produce? .....

2.4 What is your most important fruit or vegetable crop? .....

2.5 Why would you think of this as your most important one?

.....

3. SELLING

3.1 Please complete this table, giving details of fruit and vegetable crops sold from the farm, using the code provided.

CROP SOLD	TO WHOM	WHERE SOLD	FREQUENCY OF SALE	METHOD OF PAYMENT	PRICE/ QUANTITY
1.					/
2.					/
3.					/
4.					/
5.					/
6.					/
7.					/
8.					/
9.					/
10.					/
PLEASE GIVE CROP NAME.	1=consumer 2=trader 3=govt. agency 4=co-op. 5=other	1=at farm 2=in near village 3=other village 4=Kariakoo 5=other	1=weekly 2=monthly 3=bi-annually 4=annually 5=other	1=cash 2=credit 3=kind 4=other	estimate Tshs per kilo of an average sale

(Where the "other" option is selected, please specify.)

4. CREDIT

4.1 Do you have access to credit? .....

4.2 What is the maximum you could use? .....

4.3 In an average year, how frequently do you use credit? .....

4.4 Who do you get credit from?
(1=trader, 2=co-operative, 3=marketing agency,)
(4=kin, 5=other, please specify) .....

4.5 What agricultural purpose do you use credit for .....

5. INFORMATION AND DECISIONS

5.1 Do you know what crops traders want to buy before you go to them to sell your harvest?

.....

5.2 Where does this information come from?
(1=traders, 2=kin/friends, 3=radio,)
(4=newspaper, 5=rumour, 6=other.)
(If reponse is "other", please specify) .....

5.3 Below are listed a series of issues involved in decisions taken by farmers:-

A. soil fertility
B. water availability
C. danger of erosion
D. resistance of crop to pests
E. crop requires a lot of work
F. crop requires a lot of inputs
G. I have been trained to grow this crop
H. I have always grown this crop
I. there is always demand for this crop
J. this crop always gets a good price
K. this crop has always been grown here
L. other reason (please specify)

Please select and list, in order of priority, the issues from this list that you think are important in the following decision (Write in the letter next to the selection):-

(a) The crop to concentrate on growing for the market.

1..... 5.....

2..... 6.....

3..... 7.....

4..... 8.....

(b) The amount of land to devoted to growing the most important crop.

1..... 5.....

2..... 6.....

3..... 7.....

4..... 8.....

(c) Which land parcels to devote to growing the most important crop.

1..... 5.....

2..... 6.....

3..... 7.....

4..... 8.....

UNVERSITY OF DAR ES SALAAM
DEPARTMENT OF GEOGRAPHY

FRUIT AND VEGETABLE SUPPLY FOR DAR ES SALAAM

TRADERS SURVEY

1. PERSONAL CHARACTERISTICS

1.1 Sex. (Delete where applicable) MALE/FEMALE

1.2 How old are you? .....

1.3 How many years of schooling have you had? .....

1.4 Do you have another job? If "yes", what is it? .....

1.5 Where do you normally live? .....

1.6 Where do you normally buy the produce you deal with?

.....

1.7 What types of produce do you deal with?
(Please rank in order of importance)

1..... 2.....

3..... 4.....

5..... 6.....

7..... 8.....

9..... 10.....

1.8 How long have you been in business as a trader? .....

1.9 Do you have anybody working for your trading business? If yes, how many? .....

2. BUYING FRUIT AND VEGETABLES

2.1 Please complete the following table, giving details of your produce purchasing, using the codes given below.

CROP BOUGHT	FROM WHOM	WHERE BOUGHT	PRICE/ QUANTITY	METHOD OF PAYMENT	FREQUENCY OF PURCHASE
1.			/		
2.			/		
3.			/		
4.			/		
5.			/		
6.			/		
7.			/		
8.			/		
9.			/		
10.			/		
Give crop name	1=producer 2=trader 3=co-op. 4=other	1=farm 2=village market 3=road-side 4=own premises 5=other	Estimate Tshs. per kilo of average purchase	1=cash 2=credit 3=kind 4=other	1=weekly 2=monthly 3=bi-annually 4=annually 5=other

(Where response is "other", please specify)

2.2 How do you find a source of produce?

.....

2.3 What is the most important factorin your decision to buy from one producer rather than another?
(1= price, 2= quality, 3=ease of access)
(4=friend/kin, 5=always buy from this source)
(6=other, please specify) .....

3.STORAGE AND PROCESSING

3.1 Please complete the following table, giving details of the storage and processing activities you carry out, using the codes provided.

CROP NORMALLY STORED	QUANTITY IN STORAGE	NORMAL LENGTH OF STORAGE	WHY DO YOU STORE?	DO YOU PROCESS THE PRODUCE?
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
Give name	estimate in kilos	in weeks	give brief explanation	1=yes 2=no

3.2 Please use the space below to list the crops you process and what the process is.

....

....

....

....

4. TRANSPORT

4.1 Please complete the table below, giving details of the methods of transport you use, and using the code provided at the bottom.

Produce	method of transport	distance	cost	most important restraints
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
give name	1=own vehicle 2=hired vehicle 3=rail 4=other	in kilometres	in Tshs.	1=breakdowns 2=fuel cost 3=hire cost 4=time 5=other

(Where selected response is "other", please specify)

4.2 What alternative methods of transport are available?

.....

4.3 Why do you not use them?

.....

COSTS AND CREDIT

What is the greatest cost your business has to meet?

.....

Do you have access to credit
for trading activities? .....

Who do you get credit from?
(1= trader, 2=co-operative, 3=marketing agency,)
(4=kin, 5=bank, 6=other.)
(If "other", please specify.) .....

In an average year, how frequently
do you use credit for trading activities? .....

What is the maximum amount of credit
you could use? .....

What trading activities do you use credit for?

1..... 3.....

2..... 4.....

6. SELLING

6.1 Please complete the following table, giving details of your sales of produce, using the codes provided.

PRODUCE	WHERE SOLD	TO WHOM	QUANTITY SOLD	FREQUENCY OF SALE	PRICE
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
Give name	1=Roadside 2=village market 3=city market 4=own premises 5=other	1=wholesaler 2=retailer 3=other trader 4=processor 5=other	in kg's	1=weekly 2=monthly 3=bi-annually 4=annually 5=other	in Tshs.

(Where response selected is "other", please specify)

Appendix 3.4

Key Informant Interview Schedule

UNIVERSITY OF DAR ES SALAAM
DEPARTMENT OF GEOGRAPHY

FRUIT AND VEGETABLE SUPPLY FOR DAR ES SALAAM

KEY INFORMANT'S INTERVIEW SCHEDULE

1. What organisation do you work for?

2. What is your job in this organisation?
(Give a brief description.)

3. What function, or role does your organisation fulfill in the food distribution chain supplying Dar es Salaam?

4. Please describe the elements of the fruit and vegetables distribution chain supplying Dar es Salaam.

5. What do you see as the main strengths and weaknesses of the current fruit and vegetable supply system?

6. What difficulties do you and your organisation encounter in carrying out your role in this system?

7. How do you see the system developing in the future?

8. What would you recommend for the fruit and vegetable marketing system? Why?

Appendix 3.5

List of Interviewees

date	*name*	*organisation*
31/5/89	Peter Twyford-Jones	Marketing Development Bureau, Dar es Salaam
6/6/89	Mr Eliab Chijoriga	General Manager, Kariakoo Market Corporation (KMC), Dar es Salaam
7/6/89	Mr J van Donge	Political economist, University of Dar es Salaam
13/6/89	Mr Omollo & assistants	Senior tally clerk, KMC, Dar es Salaam
19/6/89	Mr Eliab Chijoriga	General Manager, KMC, Dar es Salaam
17/8/89	C Mashauri	Magole Farm Enterprises private agricultural trading comnpany
21/8/89	Mr Matero	Kilimo Office, Korogwe
22/8/89	Kime Gadi Petro jnr.	Farmer, Lushoto
23/8/89	Jörg Heinrich	Forestry Officer, Soil Erosion Control Agro-Forestry Project, (SECAP), Lushoto
25/8/89	2 Farmer's Wives	working in field Soni (Idi Mfunda translated [1])
	Farmer/Bwana Shamba	working in field (Idi Translated)
26/8/89	Group of farmers/traders	at village Party office (H. Gama translated [2])
27/8/89	Mr Mgunga	Head of agricultural Section, SECAP, Lushoto
	Kime Gadi Petro snr.	Farmer, entrepreneur and former civil servant, Lushoto
	(no name given)	Revenue collector, Lushoto village market
28/8/89	Mr Mchara	Geography Teacher, Shambalai Secondary School, nr. Lushoto
31/8/89	Mrs Rimoy	Horticultural Specialist, Kilimo Office, Lushoto
1/9/89	(no name given)	farmer on the Tanga-Dar es Salaam bus
7/9/89	S. M. Ukwama	Market Secretary, Mwenge Market, Dar es Salaam (trans. Gama)
8/9/89	Lawrence Masanja	Revenue Collector (wholesale), KMC, Tandale Market, Dar es Salaam (tr. Gama)
8/9/89	Amaria	Revenue Collector (retail), Tandale Market, Dar es Salaam (tr. Gama)
10/9/89	(no name given)	Market Secretary, Ubungo Market, Dar es Salaam (tr. Gama)
12/9/89	(no name recorded)	Market Secretary,Tandika Market, Dar es Salaam (carried out by Gama)
	Dr Ashimogo	Department of Rural Economics, Sokoine University of Morogoro
15/9/89	Mr Majumba	Horticulture Officer, Kilimo Office, Mgeta Division
	group discussion	farmers, traders and the village secretary, primary co-operative office, Nyandira (trans. Idi)
	Edward Nyombe	Chairman primary cooperative (trans. Idi)
	Zuberi Mwakikumbwa	Bwana Shamba, Kibuko village (trans. Idi)
15/9/89	Thiery Lasalle	Horticulturist for Franco-Tanzanian Horticultural Development Project, Nyandira
16/9/89	(no name given)	vegetable trader, wholesale fruit and vegetable market, Langali village (trans. Idi)
	Mr Saleko	Bwana Shamba, Langali Village (trans. Idi)
	Mr Shekelango	Bwana Shamba, Tchanzema village
21/9/89	Mr Eliab Chijoriga	General Manager, KMC, Dar es Salaam
22/9/89	Peter Twyford-Jones	Marketing Development Bureau, Dar es Salaam

Footnotes

1 Idi Mfunda, fieldwork assistant, mainly involved in rural fieldwork.
2 H C Gama, fieldwork assistant, mainly involved in market surveys.

Appendix 3.6

Random Numbers Generated by a Pocket Calculator and Used to Derive a Sampling Framework for Kariakoo Daily Delivery Data (0s and number greater than 7 ignored)

533	715	246	137	374	356	154	615	266	612	653	235
671	715	634	566	427	477	245	314	365	147	651	145
273	367	431	325	523	411	631	573	776	421	212	346
732	372	647	326	535							

Appendix 4.1

Volume of Deliveries to Kariakoo Market (1981-88) in Metric Tonnes

Vegetables	1981	1982	1983	1984	1985	1986	1987	1988
Moshi/etc.	419	243	122	342	398	86	65	151
Lushoto/etc.	2,255	2,341	3,185	5,054	5,475	4,425	4,721	4,623
Moro./etc.	1,946	1,804	2,067	2,541	3,799	4,183	3,031	3,218
Iringa	2,668	4,120	8,031	5,633	5,184	5,064	4,423	2,689
TOTAL	7,288	8,508	13,405	13,570	14,856	13,757	12,239	10,680

Other Vegetables	1981	1982	1983	1984	1985	1986	1987	1988
Onions	3,401	4,265	4,286	5,346	5,675	5,112	5,283	5,749
Cabbages	2,527	3,187	3,205	4,441	3,210	3,302	2,923	3,740
Peas	287	617	544	477	753	694	589	713
Irish Potatoes	9,497	11,504	9,014	14,278	15,773	17,032	19,095	21,378
TOTAL	15,712	19,573	17,049	24,542	25,411	26,140	27,890	31,580

Citrus Fruit	1981	1982	1983	1984	1985	1986	1987	1988
Limes	189	208	233	554	197	100	220	254
Oranges	5,015	4,820	3,566	2,780	2,229	1,526	1,403	1,576
Lemons	249	293	321	242	310	81	117	35
TOTAL	5,453	5,321	4,120	3,576	2,736	1,707	1,740	1,865

Other Fruit	1981	1982	1983	1984	1985	1986	1987	1988
G Mangoes	2,007	1,963	1,647	2,292	1,465	1,148	1,458	1,566
R Mangoes	1,134	256	434	957	596	879	1,737	558
Pineapples	147	171	171	135	108	112	110	140
R Bananas	1,898	2,720	5,642	4,348	4,358	2,816	2,037	1,818
Coconuts	9,680	10,167	9,100	9,229	6,761	8,305	7,201	5,007
Total	14,866	15,277	16,994	16,961	13,288	13,260	12,543	9,089

Overall Total	43,319	48,679	51,568	58,649	56,290	54,864	54,412	53,214

Volume of Deliveries to Kariakoo continued: Percentage of each group

Tomatoes

	1981	1982	1983	1984	1985	1986	1987	1988
Moshi/etc.	5.8	2.9	0.9	2.5	2.7	0.6	0.5	1.4
Lushoto/etc.	30.9	27.5	23.8	37.2	36.9	32.2	38.6	43.3
Moro./etc.	26.7	21.2	15.4	18.7	25.6	30.4	24.8	30.1
Iringa	36.6	48.4	59.9	41.5	34.9	36.8	36.1	25.2
Group%	16.8	17.5	26.0	23.1	26.4	25.1	22.5	20.1

Other Vegetables

	1981	1982	1983	1984	1985	1986	1987	1988
Onions	21.6	21.8	25.1	21.8	22.3	19.6	18.9	18.2
Cabbages	16.1	16.3	18.8	18.1	12.6	12.6	10.5	11.8
Peas	1.8	3.2	3.2	1.9	3.0	2.7	2.1	2.3
Irish Potatoes	60.4	58.8	52.9	58.2	62.1	65.2	68.5	67.7
Group%	36.3	40.2	33.1	41.8	45.1	47.6	51.3	59.3

Citrus Fruit

	1981	1982	1983	1984	1985	1986	1987	1988
Limes	3.5	3.9	5.7	15.5	7.2	5.9	12.6	13.6
Oranges	92.0	90.6	86.6	77.7	81.5	89.4	80.6	84.5
Lemons	4.6	5.5	7.8	6.8	11.3	4.7	6.7	1.9
Group%	12.6	10.9	8.0	6.1	4.9	3.1	3.2	3.5

Other Fruit

	1981	1982	1983	1984	1985	1986	1987	1988
G Mangoes	13.5	12.8	9.7	13.5	11.0	8.7	11.6	17.2
R Mangoes	7.6	1.7	2.6	5.6	4.5	6.6	13.8	6.1
Pineapples	1.0	1.1	1.0	0.8	0.8	0.8	0.9	1.5
R Bananas	12.8	17.8	33.2	25.6	32.8	21.2	16.2	20.0
Coconuts	65.1	66.6	53.5	54.4	50.9	62.6	57.4	55.1
Group%	34.3	31.4	33.0	28.9	23.6	24.2	23.1	17.1

Appendix 4.2

Mean Monthly Volume of Deliveries at Kariakoo

Tomatoes

	Moshi & Dodoma	Lushoto & Mbeya	Morogoro etc.	Iringa	Total
January	6.2	663.5	58.7	251.3	979.7
February	7.6	702.8	26.5	142.9	879.8
March	12.7	630.2	7.5	205.2	855.6
April	24.4	427.9	2.7	390.5	845.5
May	25.8	268.2	0.9	588.9	883.8
June	48.3	123.8	20.1	721.9	914.1
July	55.2	129.0	145.1	595.0	924.3
August	20.1	83.0	373.6	377.3	854.0
September	4.4	46.5	696.8	226.5	974.2
October	22.6	106.1	768.8	305.1	1202.6
November	9.5	246.3	502.3	434.3	1192.4
December	14.8	442.1	172.6	453.6	1083.1

Other Vegetables

	Onions	Cabbages	Peas	I Potatoes	Total
January	329.0	285.2	17.5	1280.4	1912.1
February	343.8	266.4	28.0	1289.8	1928.0
March	372.7	285.9	41.6	1462.2	2162.4
April	414.8	265.2	37.0	1399.4	2116.4
May	434.8	255.9	62.0	1451.5	2204.2
June	405.4	237.1	73.6	1304.0	2020.1
July	444.8	256.8	96.5	1265.6	2063.7
August	469.4	268.9	97.1	1043.7	1879.1
September	470.3	287.4	69.3	1248.9	2075.9
October	439.2	310.6	39.5	1155.6	1944.9
November	406.5	299.9	21.8	1002.7	1730.9
December	383.1	276.5	13.5	1113.5	1786.6

Citrus Fruit

	Oranges	Limes	Lemons	Total
January	155.7	24.1	2.6	182.4
February	76.2	23.0	1.0	100.2
March	138.0	21.8	1.3	161.1
April	210.8	16.9	4.3	232.0
May	254.7	19.5	8.4	282.6
June	328.5	16.8	14.8	360.1
July	350.6	18.9	21.4	390.9
August	369.7	21.3	31.4	422.4
September	311.1	33.1	48.8	393.0
October	173.1	9.9	41.5	224.5
November	183.7	13.9	26.4	224.0
December	189.8	17.7	12.8	220.3

Other Fruit

	G.Mangoes	R Mangoes	Pineapples	R Bananas	Coconuts	Total
January	240.7	97.3	34.0	213.6	562.8	1148.4
February	202.4	44.5	15.6	271.0	629.5	1163.0
March	184.5	9.1	9.9	260.6	692.2	1156.3
April	55.8	2.0	5.0	220.9	624.3	908.0
May	71.8	3.1	3.8	235.0	638.8	952.5
June	189.7	12.0	3.5	220.9	639.9	1066.0
July	232.4	14.2	3.6	233.9	777.4	1261.5
August	189.7	4.8	2.9	248.1	887.9	1333.4
September	27.4	52.7	2.6	289.6	714.0	1086.3
October	13.8	286.6	4.6	320.1	627.8	1252.9
November	105.1	373.3	14.0	301.4	518.6	1312.4
December	125.1	233.5	33.9	237.5	514.3	1144.3

Real Value (1981 Tanzanian Shilling levels)

Tomatoes	1981	1982	1983	1984	1985	1986	1987	1988
Moshi & Dodoma	2,427,470	1,723,748	911,683	1,771,289	2,426,915	496,534	398,783	1,752,282
Lushoto & Mbeya	13,271,630	18,637,383	26,753,275	33,266,231	31,146,461	25,757,399	51,825,032	89,107,309
Morogoro etc.	11,065,490	9,102,941	11,978,558	10,907,628	17,109,671	17,428,861	17,707,124	21,965,034
Iringa	12,805,190	24,700,264	47,512,416	27,913,041	26,328,342	25,688,377	33,407,511	34,536,311
Total	39,569,780	54,164,336	87,155,932	73,858,189	77,011,389	69,371,171	103,338,449	147,360,936

Other Vegetables	1981	1982	1983	1984	1985	1986	1987	1988
Onions	26,746,590	26,835,038	35,559,715	28,784,137	27,480,788	31,727,161	74,074,268	91,790,853
Cabbages	4,298,370	8,346,305	13,683,539	13,570,917	11,135,293	13,551,353	25,060,325	34,149,814
Peas	3,006,840	4,719,676	5,382,798	3,926,373	5,945,533	7,144,746	8,071,020	15,226,857
I. Potatoes	30,775,000	31,117,255	34,955,280	55,751,843	65,148,287	72,890,803	109,758,268	177,294,744
Total	64,826,800	71,018,273	89,581,333	102,033,271	109,709,901	125,314,063	216,963,881	318,462,268

Citrus Fruit	1981	1982	1983	1984	1985	1986	1987	1988
Limes	987,030	952,242	1,400,177	1,517,599	994,972	585,724	1,670,431	1,092,490
Oranges	8,803,945	13,027,749	15,049,847	11,720,333	9,532,830	5,191,682	7,443,612	10,614,132
Lemons	649,777	667,466	1,524,786	283,578	284,813	146,181	543,052	116,551
Total	10,440,752	14,647,457	17,974,810	13,521,509	10,812,615	5,923,587	9,657,095	11,823,172

Other Fruit	1981	1982	1983	1984	1985	1986	1987	1988
G Mangoes	2,670,410	4,187,624	5,648,607	5,895,323	4,452,023	3,096,287	3,834,453	5,010,577
R Mangoes	2,168,050	1,076,486	1,144,822	1,714,564	1,963,543	3,024,229	975,307	2,781,399
Pineapples	1,388,545	1,686,139	2,130,833	1,894,332	1,867,982	1,576,405	1,212,185	1,757,019
R Bananas	5,096,090	8,321,787	15,479,876	9,557,367	11,190,236	8,516,155	11,099,410	15,009,738
Coconuts	41,642,854	54,090,219	43,591,112	32,744,975	25,779,096	34,156,501	48,736,620	51,786,759
Total	52,965,949	69,362,255	67,995,250	51,806,560	45,252,880	50,369,577	65,857,974	76,345,492

Overall Total	167,803,281	209,192,321	262,707,324	241,219,529	242,786,785	250,978,399	395,817,399	553,991,868

Appendix 4.4

% Share of Value of Deliveries

	1981	1982	1983	1984	1985	1986	1987	1988
Moshi & Dodoma	6.1	3.2	1	2.4	3.2	0.7	0.4	1.2
Lushoto & Mbeya	33.5	34.4	30.7	45	40.4	37.1	50.2	60.5
Morogoro etc.	28	16.8	13.7	14.8	22.2	25.1	17.1	14.9
Iringa	32.4	45.6	54.5	37.8	34.2	37	32.3	23.4
Total	23.6	25.9	33.2	30.6	31.7	27.6	26.1	26.6

	1981	1982	1983	1984	1985	1986	1987	1988
Onions	41.3	37.8	39.7	28.2	25	25.3	34.1	28.8
Cabbages	6.6	11.8	15.3	13.3	10.1	10.8	11.6	10.7
Peas	4.6	6.6	6	3.8	5.4	5.7	3.7	4.8
I. Potatoes	47.5	43.8	39	54.6	59.4	58.2	50.6	55.7
Total	38.6	33.9	34.1	42.3	45.2	49.9	54.8	57.5

	1981	1982	1983	1984	1985	1986	1987	1988
Limes	9.5	6.5	7.8	11.2	9.2	9.9	17.3	9.2
Oranges	84.3	88.9	83.7	86.7	88.2	87.6	77.1	89.8
Lemons	6.2	4.6	8.5	2.1	2.6	2.5	5.6	1
Total	6.2	7	6.8	5.6	4.5	2.4	2.4	2.1

	1981	1982	1983	1984	1985	1986	1987	1988
G Mangoes	5	6	8.3	11.4	9.8	6.1	5.8	6.6
R Mangoes	4.1	1.6	1.7	3.3	4.3	6	1.5	3.6
Pineapples	2.6	2.4	3.1	3.7	4.1	3.1	1.8	2.3
R Bananas	9.6	12	22.8	18.4	24.7	16.9	16.9	19.7
Coconuts	78.6	78	64.1	63.2	57	67.8	74	67.8
Total	31.6	33.2	25.9	21.5	18.6	20.1	16.6	13.8

Appendix 4.5

Deflated Mean Annual Price per Metrict Tonne

	1981	1982	1983	1984	1985	1986	1987	1988
Tomatoes								
Moshi/Dodoma	7,472	8,202	7,693	6,659	5,924	5,768	7,186	10,496
Lushoto/Mbeya	6,029	7,662	7,233	6,428	6,009	6,378	9,533	15,662
Moro./Ruvu/Mkaiye	7,936	7,820	7,276	4,705	4,847	4,942	7,280	11,040
Iringa	4,645	6,438	6,825	4,802	5,062	4,738	7,552	12,569
Onions	8,013	6,209	10,211	5,362	4,912	6,239	14,116	16,267
Cabbages	1,665	2,660	4,383	3,053	3,495	4,133	8,678	9,531
Potatoes	3,356	2,849	3,970	4,004	4,132	4,341	5,745	8,348
Peas	5,873	9,099	9,870	8,877	8,075	11,425	16,687	24,864
Oranges	1,824	2,979	7,411	5,239	4,004	3,552	5,491	6,986
Limes	5,583	5,247	6,087	4,009	5,213	5,826	6,108	4,476
Lemons	2,682	4,998	3,718	1,362	1,035	1,738	4,375	3,800
G Mangoes	1,600	2,922	5,300	2,784	2,974	2,710	3,064	3,447
R Mangoes	1,671	4,391	4,278	3,157	3,307	2,903	3,197	5,293
Pineapples	9,188	10,047	13,688	15,426	16,113	13,670	11,542	15,059
Ripe Bananas	2,722	5,520	2,753	2,198	2,572	3,028	5,457	9,370
Coconuts	4,452	5,293	4,753	3,596	3,840	4,144	7,378	11,616

Appendix 5.1

Note Regarding the Criteria for Acceptance of Chi Square Data

Siegel (1956) states quite clearly that the expected frequencies in each contingency table cell should not be too small. "When this requirement is violated, the results of the test are meaningless." (p. 178). Cochran (1954) recommends that "too small" is where fewer than 20 per cent of the cells should have an expected frequency of less than 5 and that no cell should have an expected frequency of less than 1. Siegel (1956) recomends that where expected frequencies may be too small, adjacent categories can be combined until there are sufficient and high enough expected frequencies. Alternatively, in order to guard against this eventuality, large samples should be used. However, Baker and Lee (1975) conclude that acceptable criteria could be set more liberal than Cochran's 1954 criteria, reporting that there is considerable dispute within the literature over the accepted criteria regarding the minimum acceptable expected frequencies. Lancaster (1969) applies the chi square test where no more than a third of the cells have an expected frequency of less than 5. Chapman and Schaufele (1970) set the criteria only that no expected frequency should be less than 1. Ferguson (1971) argues that "an expectation of 2 or more in each cell will permit the estimation of roughly approximate probabilities" (p. 198). As a result it was decided to set the minimum expected frequenies criteria as follows: no cell should have an expected frequeny of less than 1 and that no more than a third of all cells should have an expected frequeny of less than 5.

Appendix Bibliography

BAKER E J and LEE Y (1975) 'Alternative analyses of geographical contingency tables.' *Professional Geographer.* Vol 27, pp. 179-188.

CHAPMAN D G and SCHAUFELE R A (1970) *Elemenatry Probability Models and Statistical Inference.* Ginn-Blaisdell, Waltham, Massachusetts.

COCHRAN W C (1954) 'Some methods for strengthening the common chi-squared tests.' *Biometrics.* Vol 10, P.417.

FERGUSON G A (1971) *Statistical Analysis in Psychology and Education.* McGraw-Hill, New York.

LANCASTER H O (1969) *The Chi-squared Distribution.* John Wiley & Sons, New York.

SIEGEL S (1956) *Nonparametric Statistics for the Behavioural Sciences.* McGraw-Hill, New York.

Appendix 7.1

Mean Anual Real Market Margins (1981 Tanzanian Shillings)

Cabbage

	Moshi	Morogoro	Tanga	Lushoto	Mbeya	Iringa
1983	1.42	3.57	3.97	7.57	11.32	3.76
1984	-4.04	0.35	-1.97	2.84	2.73	2.10
1985	1.14	2.01	1.83	5.21	1.16	4.09
1986	2.19	1.90	2.40	4.30	3.11	3.84
1987	-0.31	0.25	-0.04	3.64	2.61	3.09
1988	1.34	1.71	0.24	2.91	2.92	2.96
1989	1.98	-0.06	1.09	3.62	2.34	3.32

Coconut

	Moshi	Morogoro	Tanga	Lushoto	Mbeya	Iringa
1983	-1.27	0.25	0.96	-0.90	-5.17	-4.71
1984	-0.48	0.07	0.97	-0.06	-2.44	-2.13
1985	-0.72	0.58	1.08	-0.17	-1.27	-1.86
1986	0.18	0.87	1.47	-2.89	3.53	-0.90
1987	-0.51	-0.17	0.91	0.34	1.01	-1.69
1988	0.11	0.51	0.47	-0.13	2.00	-1.71
1989	-0.06	0.85	0.78	0.41	2.36	-1.94

Irish Potatoes

	Moshi	Morogoro	Tanga	Lushoto	Mbeya	Iringa
1983	2.63	5.85	1.60	4.70	9.89	5.21
1984	-1.32	1.84	-1.54	0.61	3.19	1.53
1985	-1.39	1.92	-0.94	1.67	3.37	1.71
1986	-0.16	1.50	0.54	1.96	3.36	1.45
1987	-0.42	1.11	0.22	2.71	2.73	1.12
1988	0.38	1.40	0.33	1.45	2.13	0.49
1989	0.23	1.62	-0.44	2.35	2.35	1.28

Onion

	Moshi	Morogoro	Tanga	Lushoto	Mbeya	Iringa
1983	-3.47	2.67	-5.14	-6.76	-15.79	-5.27
1984	0.64	2.87	2.09	1.35	6.88	-0.72
1985	-0.09	0.97	-0.38	3.94	2.63	-2.57
1986	-1.61	0.13	1.83	1.85	3.26	-3.42
1987	-0.97	2.26	0.34	0.55	4.92	-2.97
1988	2.10	3.36	0.91	1.13	4.59	-2.45
1989	4.38	4.80	3.87	7.39	9.24	-0.88

Oranges

	Moshi	Morogoro	Tanga	Lushoto	Mbeya	Iringa
1983	0.55	0.67	0.71	0.74	0.72	0.13
1984	0.37	-0.17	0.36	0.61	0.13	-0.03
1985	0.11	0.25	0.42	0.32	0.14	-0.14
1986	0.24	0.34	0.34	0.33	0.20	0.08
1987	0.11	0.13	0.21	0.34	0.27	0.16
1988	-0.02	0.19	0.11	0.16	0.29	-0.12
1989	0.13	0.03	0.27	0.34	0.17	-0.06

Ripe Bananas

	Moshi	Morogoro	Tanga	Lushoto	Mbeya	Iringa
1983						
1984	0.02	-0.75	-0.25	0.50	0.25	-1.00
1985	-0.29	-0.44	-0.10	0.27	0.33	-0.70
1986	-0.08	-0.23	0.07	0.17	0.24	-0.35
1987	0.02	-0.06	0.17	0.35	0.42	0.01
1988	0.36	0.26	0.38	0.40	0.55	0.12
1989	0.37	0.30	0.41	0.57	0.74	0.41

Tomatoes

	Moshi	Morogoro	Tanga	Lushoto	Mbeya	Iringa
1983	3.95	0.65	2.30	11.91	13.15	11.34
1984	2.52	0.93	-1.56	9.16	8.85	3.07
1985	4.33	-4.24	3.10	8.48	7.36	3.30
1986	2.39	-0.88	2.54	6.57	6.22	3.55
1987	1.73	-0.41	2.17	6.68	6.01	3.13
1988	6.29	5.75	3.44	7.21	7.61	3.79
1989	4.08	2.68	2.15	8.11	7.92	3.88

Appendix 7.2

Mean Monthly Real Market Margins (19481 Tanzanian Shillings)

Cabbage

	Moshi	Morogoro	Tanga	Lushoto	Mbeya	Iringa
January	4.50	9.25	2.36	16.14	15.32	11.64
February	5.71	10.29	11.39	18.59	13.18	13.52
March	13.71	11.18	4.96	16.18	11.07	12.18
April	15.39	12.89	5.93	12.23	15.93	14.04
May	14.82	7.14	7.75	25.45	20.46	19.89
June	11.00	11.21	5.82	17.00	18.82	17.05
July	-12.25	-7.07	-9.18	10.61	9.55	8.32
August	-3.29	2.63	-0.46	18.69	17.73	12.00
September	-1.04	0.08	0.63	12.96	15.46	10.46
October	1.75	5.90	3.25	14.90	12.25	14.40
November	4.07	7.64	3.68	17.30	13.82	12.90
December	1.79	4.86	3.57	13.27	14.61	11.11

Coconut

	Moshi	Morogoro	Tanga	Lushoto	Mbeya	Iringa
January	1.39	3.32	5.89	2.29	12.00	-7.39
February	1.04	9.46	7.25	4.14	9.89	-6.64
March	0.19	7.96	7.14	2.61	8.96	-6.54
April	6.57	5.82	4.80	0.39	8.39	-4.68
May	-1.38	1.00	1.93	2.32	6.29	-8.79
June	0.11	-0.82	1.79	3.54	6.29	-8.75
July	0.21	0.00	2.86	-14.96	5.86	-7.07
August	-4.09	0.63	1.50	3.25	5.33	-8.21
September	-3.58	0.38	1.88	-1.04	2.04	-6.00
October	-3.30	0.15	1.95	-2.04	9.15	-7.40
November	-3.36	0.39	1.64	0.86	8.57	-7.43
December	-0.21	3.25	4.98	2.11	9.32	-6.96

Irish Potato

	Moshi	Morogoro	Tanga	Lushoto	Mbeya	Iringa
January	3.93	7.50	3.21	7.37	13.57	4.71
February	-4.57	14.54	1.29	1.29	11.43	3.39
March	-1.86	17.00	5.68	5.68	13.11	5.86
April	10.39	9.46	-0.75	-0.75	12.75	5.25
May	3.32	8.89	-0.07	-0.07	12.86	5.86
June	3.93	5.79	-1.25	-1.25	12.00	6.07
July	0.18	3.86	-3.11	-3.11	14.86	6.71
August	-5.82	5.09	-1.70	-1.70	13.01	3.84
September	-2.08	4.00	0.38	0.38	12.50	5.00
October	-3.35	3.75	0.60	0.60	12.55	3.65
November	-3.29	5.50	-0.07	-7.00	8.64	3.36
December	-1.79	4.14	2.74	2.74	11.62	5.21

Onions

	Moshi	Morogoro	Tanga	Lushoto	Mbeya	Iringa
January	-0.96	19.04	6.25	3.07	12.21	-10.29
February	0.79	20.07	15.96	8.29	18.36	-7.64
March	30.64	22.79	14.46	19.00	31.14	-7.04
April	13.52	21.57	12.46	23.59	36.64	-6.50
May	21.70	20.54	14.29	37.68	42.29	1.50
June	3.25	6.71	-2.29	14.46	28.29	-19.79
July	-5.11	9.50	3.46	28.03	28.31	-12.25
August	-15.54	-12.63	-9.88	-8.96	5.00	-25.33
September	-3.08	7.04	2.67	-2.11	19.46	-8.54
October	-4.20	19.50	5.45	13.22	17.80	-7.83
November	0.93	8.14	2.50	2.74	14.21	-8.07
December	3.47	8.14	4.50	1.42	13.39	-7.75

Oranges

	Moshi	Morogoro	Tanga	Lushoto	Mbeya	Iringa
January	-0.29	2.04	0.68	1.63	1.96	0.14
February	-0.32	2.54	0.59	1.86	0.43	0.29
March	2.43	1.11	0.77	1.25	0.87	0.30
April	0.98	1.05	0.62	1.37	0.77	-0.89
May	1.48	1.07	1.37	2.00	0.89	0.34
June	1.27	0.30	1.80	0.96	1.00	0.29
July	0.21	0.21	1.06	1.46	1.04	-0.27
August	0.19	0.94	1.37	2.54	1.13	-0.19
September	-0.65	0.60	0.63	0.71	1.54	-0.50
October	-0.07	1.18	1.23	2.33	3.23	-0.82
November	0.12	0.14	1.25	1.55	2.93	-0.05
December	0.46	1.75	1.29	1.36	2.89	0.93

Ripe Bananas

	Moshi	Morogoro	Tanga	Lushoto	Mbeya	Iringa
January	0.42	0.29	0.54	0.64	1.10	0.04
February	-0.17	0.88	0.23	0.45	0.83	-0.18
March	0.19	0.95	0.57	0.83	1.07	-0.12
April	1.30	0.73	0.77	1.02	1.56	0.28
May	0.85	1.12	0.93	1.16	1.71	-0.80
June	0.68	-0.50	0.64	1.43	1.47	0.21
July	0.98	0.07	1.05	1.41	1.93	0.95
August	0.34	0.21	0.45	1.00	1.16	0.04
September	-0.09	-0.29	0.27	0.35	-0.53	0.04
October	-0.01	-0.23	0.62	0.89	1.31	0.18
November	0.19	-0.16	0.18	0.59	0.58	-0.14
December	0.23	-0.27	0.11	0.61	1.04	-0.09

Tomatoes

	Moshi	Morogoro	Tanga	Lushoto	Mbeya	Iringa
January	14.31	8.54	12.44	32.87	30.99	16.17
February	17.29	8.04	14.16	38.22	33.71	16.40
March	19.93	17.88	22.91	41.98	35.21	14.58
April	41.01	1.88	24.83	54.54	55.75	31.04
May	23.57	-1.63	14.29	48.61	54.79	24.54
June	27.92	-8.65	20.83	53.23	56.46	33.75
July	17.79	-2.39	12.86	41.04	47.99	28.68
August	5.92	-8.38	-1.79	25.65	25.03	10.96
September	4.68	-1.46	1.08	19.44	17.68	8.79
October	2.71	-5.63	-0.21	14.85	15.10	5.50
November	2.50	-4.54	4.63	17.23	17.76	8.54
December	7.21	3.75	2.71	22.57	21.21	9.50

Appendix 8.1

Breakdown of the Employment Categories

Employment	Grouping	Frequency	Percentage
Business	Commercial	25	20.7
Business (Market)	Commercial	8	6.6
Business (Hotel)	Commercial	7	5.8
Business (Shop)	Commercial	7	5.8
'Local Brewing' Business	Commercial	5	4.1
Small Petty Business	Commercial	15	12.4
Bicycle Maintenance	Trade/Craft	1	0.8
Carpenter	Trade/Craft	16	13.2
Driver	Trade/Craft	1	0.8
Mechanic	Trade/Craft	1	0.8
Plumber	Trade/Craft	2	1.7
Shoe Repairer	Trade/Craft	2	1.7
Tailor	Trade/Craft	5	4.1
Timber Production	Trade/Craft	4	3.3
Accounts Clerk	Prof./Admin.	1	0.8
Community Devt. Officer	Prof./Admin.	1	0.8
Extension Officer	Prof./Admin.	2	1.7
Forestry Officer	Prof./Admin.	1	0.8
Levy Collector	Prof./Admin.	1	0.8
Medical Assistant	Prof./Admin.	1	0.8
Nursery Attendant	Prof./Admin.	2	1.7
Teacher	Prof./Admin.	4	3.3
Village Secretary	Prof./Admin.	1	0.8
Animal Keeper	Other	4	3.3
Wage Labourer	Other	3	2.5
Witch Doctor	Other	1	.8
Total		121	100.0

Appendix 8.2

Breakdown of the Crop Type Categories

Crop	Grouping	Frequency	Percentage
Cabbage	Cooking Veg.	56	21.1
Carrots	Cooking Veg.	4	1.5
Onions	Cooking Veg.	4	1.5
Leeks	Cooking Veg.	4	1.5
Cualiflower	Cooking Veg.	3	1.1
Aubergines	Cooking Veg.	1	0.4
Tomaotes	Salad Veg.	49	18.5
Sweet Pepper	Salad Veg.	5	1.9
Cucumber	Salad Veg.	4	1.5
Beetroot	Salad Veg.	2	0.8
Chinese Cabbage	Salad Veg.	1	0.4
Beans	Pulses	35	13.2
Pigeon Peas	Pulses	8	3.0
Soyabeans	Pulses	1	0.4
Bananas	Fruit	19	7.2
Jackfruit	Fruit	9	3.4
Oranges	Fruit	8	3.0
Sugercane	Fruit	8	3.0
Pears	Fruit	3	1.1
Plums	Fruit	3	1.1
Apples	Fruit	2	0.7
Peaches	Fruit	2	0.8
Pineapple	Fruit	2	0.8
Persian Fruit	Fruit	2	0.8
Green Gram	Fruit	1	0.4
Lemons	Fruit	1	0.4
Avocado	Fruit	1	0.4
Coconuts	Fruit	1	0.4
Irish potatoes	Staple	15	5.7
Cassava	Staple	6	2.3
Sweet Potatoes	Staple	3	1.1
Yams	Staple	1	0.4
Peas	Pulses	1	0.4
Total		265	100.0

Appendix 8.3

Producers' Decision Making Factors

Decision Making Factors	Group	Frequency	Percentage
To obtain cash	Economic	100	38.5
Doesn't require a lot of labour	Economic	15	5.8
Major source of income	Economic	15	5.8
Helps in food shortage	Economic	11	4.2
Consistent demand	Economic	7	2.7
Consistent price	Economic	5	1.9
Greater profit margin	Economic	5	1.9
Less competition to sell	Economic	5	1.8
Doesn't require a lot of inputs	Economic	3	1.2
No other economic activity	Economic	3	1.2
Contributes to other business	Economic	2	0.8
Wide market for selling	Economic	2	0.8
Versatility of crop	Ecologic	19	7.3
Helps with soil erosion	Ecologic	4	1.5
Short growing season	Ecologic	4	1.5
Non-perishable crop	Ecologic	2	0.8
Drought resistant	Ecologic	1	4.0
Easy to manage	Ecologic	1	0.4
For domestic use	Social/Cultutral	17	6.5
Crop (trees) inherited	Social/Cultutral	11	4.2
Planted by order of government	Social/Cultutral	1	0.4
For Ramadan fast	Social/Cultutral	1	0.4
Crops important to the area	Geographic	14	5.4
Well suited to area	Geographic	9	3.5
Given land with crop (trees)	Geographic	2	0.8
Survey Total		271	100.0

Bibliography

ABBOTT J C (1986) *Marketing Improvement in the Developing World; What happens and what we have learned.* United Nations Food and Agricultural Organisation, Rome.

AMANI H K R *et al* (1984) 'Agriculture in Economic Stabilization: policies and perspectives' in *Economic Stabilization Policies in Tanzania.* by N Lipumba (Ed). Pp.112-128. Workshop Papers, Economics Department and Economic Research Bureau, University of Dar es Salaam.

AMSELLE (1971) 'Parenté et commerce chez les Kooroko' in *The Development of Trade and Markets in West Africa.* by C. Meillassoux (Ed). Pp.253-265. Oxford University Press for the International Africa Institute, London.

BARRETT Hazel R (1986) 'The evolution of the marketing network in the Gambia, in the twentieth century.' *Tijdschrift voor Economische en Socialicsche Geografie.* Vol 77, No. 3, Pp.205-212.

BARTLETT C D S and ODERO-OGWEL L A (1976) *Feasibility Study of Fruit and Vegetable Canning Industry in Tanzania - The supply prospects.* Department of Rural Economy and Extension, University of Dar es Salaam.

BEIERMAN Werner (1990) 'Industrialism and Post-Colonial Reconstruction.' in *Capitalism, Socialism and the Development Crisis in Tanzania.* by Norman O'Neill & Kemal Mustafa (Eds). Pp.125-151. Avebury, Aldershot.

BEVAN David, BIGSTEN Arne, COLLIER Paul & GUNNING Jan Willem (1987) *East African Lessons on Economic Liberalization.* Gower Publishing, Aldershot for the Trade Policy Research Centre.

BOEKHOLT J M C and VAN DER VEEN P (1986) 'The Retail System of Vegetables in Mysore City, India.' in *Contributions to Indian Geography. Vol VII, Urban Geography.* by P D Mahadev (Ed). Pp 499-522. Heritage Publishers, New Delhi.

BOHANNAN Paul & DALTON George (Eds) (1962) *Markets in Africa.* Northwestern University Press, Evanston.

BRIGGS John A (1980) 'Villagisation and the 1974-6 Economic Crisis in Tanzania' *Journal of Modern African Studies.* Pp.695-702.

BRIGGS John A (1990) 'Food Crop Marketing in the Peri-Urban Zone of Dar es Salaam' in *Retailing Environments in Developing Countries.* by A Findlay *et al* (Eds). Pp.181-194. Routledge, London.

BRIGGS John A (1991) 'The peri-urban zone of Dar es Salaam, Tanzania: recent trends and changes in agricultural land use' *Transactions of the Institute of British Geographers.* New Series, Vol 16 No 3 Pp 319-331.

BROMLEY R (1978) 'Organisation, regulation and exploitation in the so-called "Urban Informal Sector", the street traders of Cali, Colombia' *World Deveopment.* 6, Pp.1161-71.

BRYCESON Deborah Fahy (1985) 'Food and Urban Purchasing Power: The case of Dar es Salaam, Tanzania' *African Affairs.* 84, (337), Pp499-522.

BRYCESON Deborah Fahy (1987) 'A Century of food Supply in Dar es Salaam' in *Feeding African Cities.* by J I Guyer (Ed). Pp 154-202. Manchester University Press., Manchester.

BRYCESON Deborah Fahy (forthcomng) 'Food Pricing, Spatial Egalitarian Objectives and Urban Growth in Tanzania' In a book by Cynthia Hewitt de Alcantara (Ed).

BUCKLIN Lois P (1977) 'Improving food retailing in developing countries.' *Food Policy.* May, Pp. 114-122.

CHITEJI Frank M (1980) *The Development and Socio-Economic Impact of Transportation in Tanzania 1884 - Present.* University of America Press.

CHRISTALLER W (1966) *Central Places in Southern Germany.* Prentice-Hall, Englewood Cliffs.

CLIFFE L, LAWRENCE P, LUTTRELL W, MIGOT-ADHOLLA S & SAUL J (Eds) (1975) *Rural Cooperation in Tanzania.* Tanzania Publishing House, Dar es Salaam

COHEN (1971) Cultural strategies in the organisation of trading diasporas.' in *The Development of Indigenous Trade and Markets in West Africa.* by C Meillasoux (Ed). Pp.285-302. Oxford Unversity Press for the International African Institute, London.

CONNELL John (1974) 'The Evolution of Tanzanian Rural Development' *Journal of Tropical Geography.* Vol 38, Pp.7-18.

COULSON Andrew (1977) 'Agricultural Policies in Mainland Tanzania. *'Review of African Political Economy.* Vol 10, Pp 74-96.

CROLL Elisabeth (1983) *The Family Rice Bowl; Food and the Domestic Economy in China* UN Research Institute for Social Development, Geneva and Zed Press, London.

CROUCH Susan (1987) *Western Response to Tanzanian Socialism, 1967-83.* Avebury, Aldershot.

DAILY NEWS (10/4/84) *The Forgotten Fruit Industry.* Dar es Salaam.

DELOBEL T C, EVERS G R & MAERERE A P (1989) *Position and function of deciduous fruit trees in the farming systems at Upper Mgeta, Uluguru Mountains, Tanzania* Unpublished paper. Franco-Tanzanian Horticultural Development Project, Sokoine University of Agriculture, Morogoro, Tanzania.

DRAKAKIS-SMITH David (1991) 'Urban Food Distribution in Asia and Africa' *The Geographical Journal.* Vol 157, No 1, March, Pp.51-61.

ELLIS Frank (1983) 'Agricultural Marketing and Peasant-State Transfers in Tanzania.' *Journal of Peasant Studies.* Vol 10, Pp 214-240.

ELLIS Frank (1984) 'Relative Agricultural Prices and the Urban Bias Model: A Comparative analysis of Tanzania and Fiji.' *Journal of Development Studies* Vol 2, No 3, Pp 28-51.

ELLIS Frank (1988) 'Chapter Three, Tanzania'. in *Agricultural Pricing Policy in Africa: Four Country Case Studies* by C Harvey (Ed). Pp.66-103. Institute of Development Studies, University of Essex and Macmillan Publishers.

EPSTEIN Scarlett P (1982) *Urban Food Marketing and Third World Rural Development: The structure of producer-seller markets.* Croom Helm, London.

ERGAS Zaki (1980) 'Why did Ujamaa Policy Fail?' *Journal of Modern African Studies.* Vol 18, No 3, Pp.387-410.

FINANCIAL TIMES (7/7/81) *Economic screws tighten on Tanzania.* P.28.

Food and Agricultural Organisation (1989) *Prevention of Post-harvest Food Losses: fruits, vegetables and root crops.* FAO Training Series No 17/2. Food and Agricultural Organisation of the United Nations, Rome.

GITTINGER J Price, LESLIE Joanne and HOISINGTON Caroline (Eds) (1987) *Food Policy: Integrating Supply, Distibution and Consumption.* John Hopkins University Press, Baltimore.

GORDON Henry (1988) *Open Markets for Maize and Rice in Urban Tanzania: current issues and evidence.* Unpublished Paper.

Government of Tanzania (1977) *Household and Budget Survey 1976/77.* Bureau of Statisitcs, Ministry of Finance Planning and Economic Affairs, Tanzania.

Government of Tanzania (1983) *Morogoro Regional Office Report to National Horticultural Seminar, November 1983.* Ministry of Agriculture.

Government of Tanzania (1988) *Agricultural Sample Survey of Tanzania Mainland 1986/87, Vol I: Technical Report.* Bureau of Statisitcs, Ministry of Finance Planning and Economic Affairs, Tanzania.

Government of Tanzania (1988) *Agricultural Sample Survey of Tanzania Mainland 1986/87, Vol II: Preliminary Report* Bureau of Statisitcs, Ministry of Finance Planning and Economic Affairs, Tanzania.

Government of Tanzania (1989) *1988 Census Preliminary Report.* Bureau of Statisitcs, Ministry of Finance Planning and Economic Affairs, Tanzania.

Government of Tanzania (1989) *Statistical Abstract 1987.* Bureaus of Statistics, Planning Commision, President's Office, Dar es Salaam.

GREEN R H, RWEGASIRA D G & VAN ARKEDIE B (1980) *Economic Shocks and National Policy* Institute of Social Studies, The Hague.

GRIFFITHS Elizabeth (1980) 'Food Production or Cash? - The peasant versus the state, a decision-making experience.' *Journal of Geographical Association of Tanzania.* No. 19/20, Dec/June, Pp.111-141.

GUYER J I (Ed) (1987) *Feeding African Cities.* Manchester University Press, Manchester.

HADJAVAYANIS (1987) 'Perverse Capitalism in Agriculture; A study of Nyandira Villages.' *East African Social Science Research Review.* Vol.3, No.1, Jan 1987, Pp.75-110.

HANSEN A and McMILLAN D E (Eds) (1986) *Food in Sub-Saharan Africa* Pinter, London.

HEMY C D (1961) *Vegetable Notes.* Bulletin No. 10. Department of Agriculture, Ministry of Agriculture, Tanzania.

HILL Frances (1975) 'Ujamaa: African Socialist Productionism in Tanzania,' in *Socialism in the Third World.* by H Desfosses & J Levesques (Eds). Pp 216-251. Praeger, New York.

HILL Polly (1963) 'Markets in Africa.' *Journal of Modern African Studies* 1, 4, Pp.441-453.

HODDER B W (1967) 'The Markets of Ibadan.' in *The City of Ibadan.* by P C Lloyd, A L Mabogunje and B Awe (Eds). Pp. 173-190. Cambridge University Press with the Institute of African Studies, University of Ibadan, Cambridge

HODDER B W (1965) 'Some Comments on the Origins of Traditional Markets in Afrcia South of the Sahara.' *Transactions of the Institute of British Geographers.* Vol 36, Pp.97-105.

HOLLIER Graham (1990) 'Rural Distribution Channels in West Africa.' in *Retailing Environments in Developing Countries.* by A Findlay *et al* (Eds). Pp.52-65. Routledge, London.

HYDEN Goran (1980) *Beyond Ujamaa in Tanzania: Underdevelopment and an uncaptured peasantry.* Heinemann, London.

International Labour Organisation (ILO) (1978) *Towards Self-Reliance; Development employment and equity in Tanzania.* Report to the Government of Tanzania by a Jobs and Skills Programme for Africa (JASPA) Employment Advisory Mission, Addis Ababa

JONES J V S (1987) 'Food Security and Economic Development in Tanzania: Past Problems and Proposals for a New Strategy.' Paper first presented to *The International Conference on the Arusha Declaration.* Arusha, December 1986.

JONES William O (1972) *Marketing Staple Food Crops in Tropical Africa.* Cornell University Press, Ithaca.

KAHAMA George C, MALIYAMKONO T L &WELLS Stuart (1986) *The Challenge for Tanzania's Economy.* James Currey Ltd, London.

Kariakoo Market Corporation (KMC) (1984) *Procurement and Marketing of Staple Foods - the case of Mbeya, Iringa and Morogoro Regions.* KMC Report.

Kariakoo Market Corporation (KMC) (Various) *Annual Report Numbers 1 to 12.* KMC, Dar es Salaam.

KATONA Emil (1988) 'Planning and Policy Making: factors affecting the recovery of agriculture in Tanzania.' *Development and Peace.* Vol 9, Autumn, Pp.131-152.

KAYNAK Erdener (1986) *Marketing and Economic Development.* Praeger Publishers, New York.

LADO Clephas (1988) 'Some aspects of rural marketing systems and peasant farming in Maridi district, Southern Sudan.' *Transactions of the Institute of British Geographers.* (New Series) Vol. 13, Pp361-374.

LAVRIJSEN J & STERKENBERG J J (1976) 'The Food Supply of Lilongwe, Malawi.' *Utrechtse Geografische Studies, 3.* Geografisch Instituut, Utrecht.

LAWSON (1967) 'The distributive system in Ghana, A review article' *Journal of Development Studies.* 3, (3): Pp.195-205.

LAWSON (1971) 'The supply response of retail services to urban population growth in Ghana.' in *The Development of Indigenous Trade and Markets in West Africa* by C Meillassoux (Ed). Pp.377-98. Oxford University Press, London.

LIPTON Michael (1978) *Why do Poor People Stay Poor: Urban Bias in World Development* Temple Smith, London.

LIPUMBA Nguyuru H I (1988) 'Policy reforms for economic development in Tanzania.' in *Africa's Development Challenges and the World Bank: hard questions, costly choices.* by Stephen Commins (Ed). Lynne Riener Publications, Boulder, Colorado. Pp 53-73.

LIPUMBA Nguyuru H I, MSAMBICHAKA, Lucian A and WANGWE Samuel M (1984) *Economic Stabilization Policies in Tanzania.* Economics Department and Economic Research Bureau, UDSM.

LOFCHIE Michael F (1978) 'Agrarian Crisis and Economic Liberalization in Tanzania.' *Journal of Modern African Studies.* Vol 16, No 3, Pp 451-476.

LOXLEY John (1979) 'Monetary institutions and class struggle in Tanzania.' in *Towards Socialism in Tanzania.* by Bismark Mwansasu and Cranford Pratt (Eds). Tanzania Publishing House, Dar es Salaam.

MALIYAMKONO T L and BAGACHWA M S D (1990) *The Second Economy in Tanzania* James Currey, East African Studies, James Currey, London for the East & Southern African Universities Research Programme, Dar es Salaam.

Marketing Development Bureau (1973) *The Marketing of Horticultural Crops in the Morogoro Region with Particular Reference to the Tchenzema Vegetable Farmers' Cooperative Society.* FAO/UNDP and Ministry of Agriculture, Tanzania.

Marketing Development Bureau (1974) *A Brief Review of Packaging Trial for the Tchenzema Vegetable Farmers' Co-operative Society.* FAO/UNDP Project and Ministry of Agriculture, Tanzania.

Marketing Development Bureau (1985) *Prefeasability Study of a New Fruit and Vegetale Wholesale Market for the Dar es Salaam Area* FAO/UNDP and Ministry of Agriculture, Tanzania.

Marketing Development Bureau (1986) *Aspects of the Open Market Trade for Food Commodities in Mainland Tanzania.* FAO/UNDP Project and Ministry of Agriculture, Tanzania.

Marketing Development Bureau (Various) *Annual Review of Agricultural Marketing.* Ministry of Agriculture, Tanzania, and UNDP/FAO, Dar es Salaam.

MASCARENHAS A C and MBILINYI S M (1971) 'The Orange Trade of Dar es Salaam: A case study of risk taking among peasant food producers.' *East African Journal of Rural Development.* Vol 4, No 1.

MASCARENHAS Adolfo (1984) 'Fruits and Vegetables in Tanzania's Food Profile.' Presented to The *Workshop on Food Self-Sufficiency in Sub-Saharan Africa* Dar es Salaam, 7th-9th May 1984.

MBILINYI S and MASCARENHAS A (1973) 'Bananas and the Dar es Salaam Market.' *East African Journal of Rural Development.* Vol 6, No 1, Pp 57-77.

McCALL D (1962) 'The Koforidua Market.' in *Markets in Africa.* by Bohannan P and Dalton G (Eds). Pp.667-697. Northwestern University Press, Evanston.

McGEE T G & YEUNG Y M (1977) *Hawkers in South-East Asian Cities: Planning for the bazaar economy.* International Development Research Centre, Ottawa.

MEILLASSOUX Claude (ED) (1971) *The Development of Trade and Markets in West Africa, Studies presented and discussed at the Tenth African Seminar at Fourah Bay College.* Freetown, December, 1969. Oxford University Press for the International African Institute, London.

MLAMBITI M E (1977) 'Structural patterns in produce marketing at Morogoro.' *Tanzanian Notes and Records.* No 81 &82, Pp 79-97.

MUGYABUSO R A (1988) *Market Price Review, Lushoto Market 1987.* Soil Erosion Control Agroforestry Project (SECAP) Monitoring and Evaluation Unit, Lushoto.

NURSEY-BRAY P F(1980) 'Tanzania: The development debate.' *African Affairs.* Vol 79, Pp 55-78.

NYERERE Julius (1974) *Man and Development (A selection of Speeches and Writings 1968-73).* Oxford University Press, Dar es Salaam.

O'NEILL Norman (1990) 'Introduction.' in *Capitalism, Socialism and the Development Crisis in Tanzania.* by Norman O'Neill & Kemal Mustafa (Eds). Avebury, Aldershot.

OKOKO Kimse (1987) *Socialism and Self-Reliance in Tanzania.* K P I Ltd, London.

PADDISION Ronan (1988) *Ideology and Urban Primacy in Tanzania.* CURR Discussion Paper, No 35. Centre for Urban and Regional Research, University of Glasgow, Glasgow.

PADDISON *et al* (1990) 'Retailing in Less-Developed Countries' in *Retailing Environments on Developing Countries.* by Findlay *et al* (Eds). Routledge, London.

PAUL Jean Luc (1987) 'Systems Approach Efficiency: Nyandira case study.' Presented to *Agricultural Research Workshop.* Arusha, 18th-21st May.

PAUL Jean Luc (1988) *Farming Systems in Upper Mgeta (Morogoro District).* Franco-Tanzanian Horticultural Development Project, Sokoine University of Agriculture, Morogoro.

PIAULT Marc (1971) 'Cycles de marchés et "espaces" socio-politique' in *The Developement of Trade and Markets in West Africa.* by C Meillassoux (Ed). Pp.285-302. Oxford Unversity Press for the International African Institute, London.

PLETCHER James Reed (1982) *Agricultural Policy and the Political Crisis in Zambia.* PhD. (Political Science) Thesis, University of Wisconsin.

PORTER Gina (1992) 'Food for the Urban Market; Production and distribution patterns on the Jos Plateau, Nigeria' Presented to a the *Conference on Urban Food Marketing and Consumption in the Developing Countries.* Glasgow, April 1992. Developing Areas Research Group/Institute of British Geographers.

RAIKES Philip (1979) 'Agrarian Crisis and Economic Liberalization in Tanzania: a comment.' *Journal of Modern African Studies.* Vol 17, No 2, June, Pp.309-316.

RAIKES Philip (1986) 'Eating the Carrot and Wielding the Stick: the agricultural sector in Tanzania.' in *Tanzania: Crisis and Struggle for Survival.* by J Boesen *et al* (Eds). Scandinavian Institute for African Studies, Upsalla.

RAKODI Carole (1988) 'Self-Reliance or Survival?' *Food production in African cities with partcular reference to Zambia.* Presented to Urban Food Supplies and Peri-Urban Agriculture Workshop. London, 6 May 1988. Centre for African Studies, School for Oriental and African Studies.

Regional Planning Office Tanga/TIRDEP (1985) *Regional Development Strategy, Tanga Region* Regional Planning Office and TIRDEP, Tanga.

RESNICK Idrian N (1981) *The Long Transition - Building socialism in Tanzania.* Monthly Review Press, New York.

SAMIEE Saeed (1990) 'Impediments to retailing in developing contries.' in *Retailing Environments in Developing Countries.* by A Findlay *et al* (Eds). Pp.30-39. Routledge, London.

SAWIO (forthcoming) Title to be Confirmed. PhD Dissertation. University of Dar Es Salaam.

SAYEED Sabiha (1992) 'Urban subsistence, production and urban gardens in Dhaka City Bangladesh.' Paper presented at the *Institute of British Geographers Annual Conference.* Swansea, January 1992.

SCHAEFFER W W & JENDERS S (1987) *Utilization of Fruit Surplus in Lushoto District* Tanga Integrated Rural Development Programme, Tanga.

SECAP (1988) *Soil Erosion Control Agroforestry Project (SECAP) - Project Description.* Soil Erosion Control Agro-Forestry Project, Lushoto.

Seminar für Landwirtschaftliche Entwicklung (1986) *Demand for major fruit tree seedlings, including coconut, by village formers in the lowland area of Tanga Region (Tanzania).* Technical University of Berlin (Team Leader: Peter Neuhauser).

SEN Amartya (1982) *Poverty and Famines; An essay on Entitlement and Deprivation.* Clarendon Press, Oxford.

SENDER John and SMITH Sheila (1986) *The Development of Capitalism in Africa.* Methuen, London and New York.

SENDER John and SMITH Sheila (1990) *Poverty, Class and Gender in Rural Africa: a Tanzanian case study.* Routledge, London.

SHAO (1986) 'Politics and the Fod Production Crisis in Tanzania.' in *Africa's Agrarian Crisis; The roots of famine.* by S Commins *et al* (Eds). Lynne Rienner Inc, Boulder Colorado.

SHARPLEY Jennifer (1985) 'External versus Internal Factors in Tanzania's Macroeconomic Crisis: 1973-1983.' *East Africa Economic Review (New Series).* Vol 1, No 1, December, Pp 71-85.

SKINNER (1964/65) 'Marketing and social structure in rural China, Parts I and II.' *Journal of Asian Studies.* 24, Pp. 3-43 & 195-228.

SLATER D (1974) 'Colonialism and the spatial structure of underdevelopment; Outlines of an alternative approach, with special reference to Tanzania.' *Progress in Planning.* Vol 4, Part V, Pp.146-59 .

SPORREK Anders (1985) 'Food Marketing and Urban Growth in Dar es Salaam.' *Lund Studies in Geography* Series B, No 51.

SUNDAY OBSERVER (14/12/86) *Food riots give Zambia the taste of a deeper revolt.*

SVENDSEN Knud Erik (1986) 'The Creation of Macroeconomic Imbalances and a Structural Crisis.' in *Tanzania: crisis and struggle for survival.* by J Boesen *et al* (Eds). Scandinavian Institute for African Studies, Upsalla.

TARIMO (1977) *Marketing of Vegetables in Accra.* BSc. (Hons) Dissertation,Agricultural Economics, University of Ghana.

TAUBE Gunther (1988) *An Economic Analysis of SECAP's Basic Recommendations for Soil Erosion Control.* Tanga Integrated Rural Development Programme (TIRDEP) and the SECAP, Lushoto.

TEMPLE P H (1969) 'The Urban Markets of Greater Kampala.' *Tijdschrift voor Economische en Sociale Geografie.* Vol 60 Pp.346-359.

TIRDEP (1985) *Regional Development Strategy, Tanga Region.* Tanga Integrated Rural Development Programme/Regional Planning Office, Tanga Region.

VENNETIER Pierre (1972) 'La Croisance Urbaine dans les Pays Tropicaux *Travaux et Documents de Géographie Tropicale, No. 7,* CNRS, Paris.

WOODS Roger (1975) 'Peasants and Peasantries in Tanzania and their role in socio-political development.' in *Rural Cooperation in Tanzania.* by L CLIFFE *et al* (Eds) Tanzania Publishing House, Dar es Salaam, Pp 39-50.

YEAGER Roger (1982) *Tanzania: an African experiment.* Aldershot, Boulder, Colorado.